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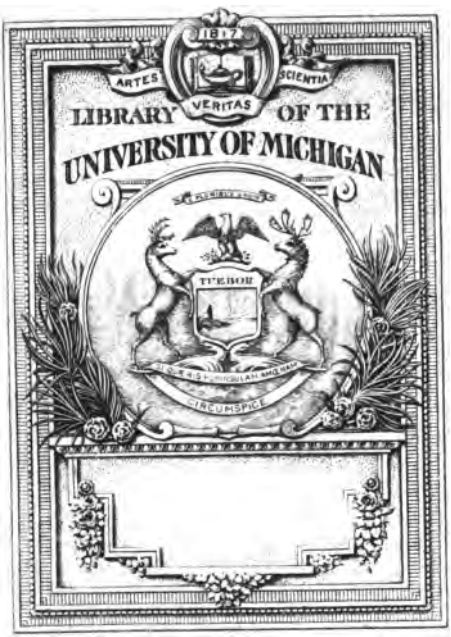

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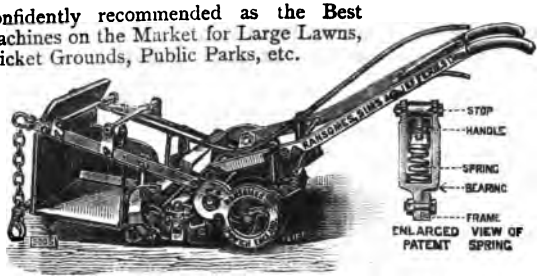

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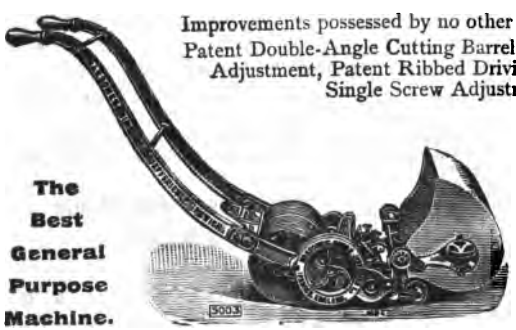

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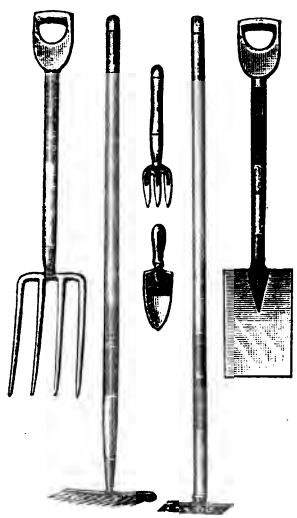

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Dear Sir,—I beg to enclose herewith an attempt to solve the question upon which you ask for notes. I need hardly say that I should be delighted were I the successful exponent.

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Dear Sir.—I think your paper is the best gardening periodical that is published. I have taken it in since last November, and enjoy it immensely. I am so glad to see that there is such an excellent article on Roses this week, as this adds greatly to the interest of a great many readers. Yours truly, W. von S.

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Dear Sir,—As the half-year subscription of GARDEN LIFE has closed, I wish to thank you for your promptitude in forwarding it to me. Now that GARDEN LIFE is so well established there ought to be no difficulty in obtaining it in the neighbourhood at all times. If I should be disappointed I can return to you, feeling sure of prompt despatch. During its existence I have been most interested in all its details, and always look forward to receiving it with pleasure. Yours truly, G. W.

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AUTHOR'S NOTE.

The contents of this book comprise a further series of the gardening articles contributed to **The Daily Telegraph** during the past year.

Two editions of 5,000 copies each of the first series have found a ready sale, and only a few copies now remain.

It is gratifying to know that such numbers of readers have availed themselves of the Notes in this permanent form, to which numerous practical illustrations have been added.

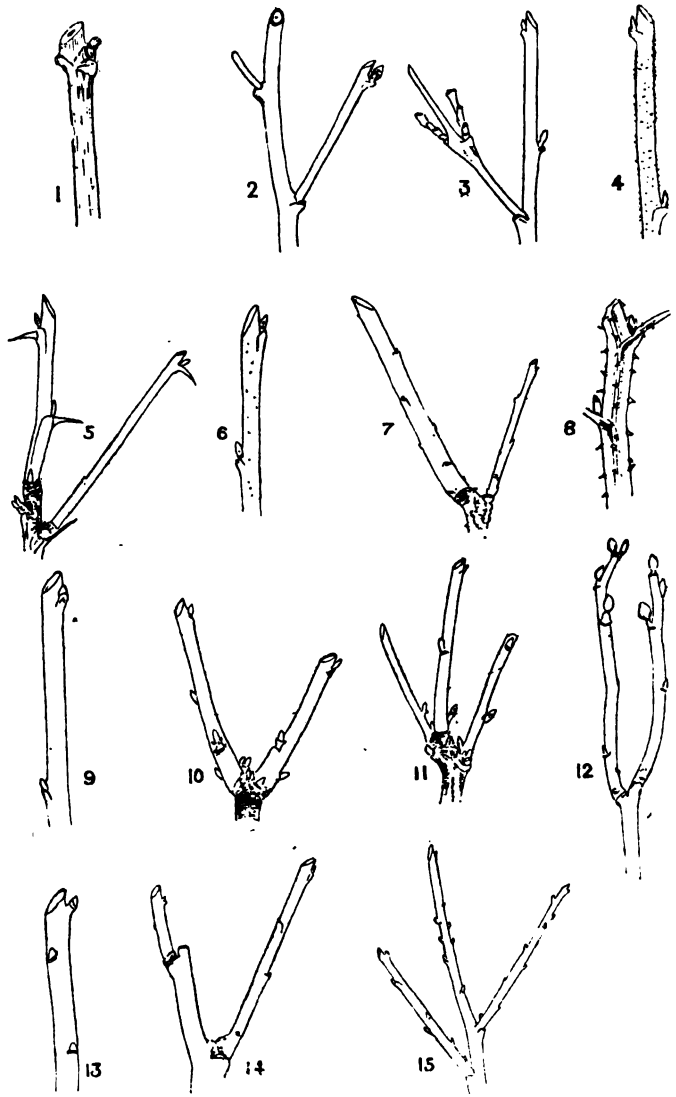
I have again to express my thanks to the Proprietors of **The Daily Telegraph** for the special permission to reproduce these Notes in book form, and to numerous correspondents who have written me regarding them.

DONALD McDONALD,

Fellow of the Linnean Society.

CLEEVE HOUSE,
BEXLEY HEATH, KENT.

January 1st, 1903.



A Lesson in Pruning.

See chapter commencing page 10; also see page 9.

1.—Grape. 2.—Nectarine. 3.—Peach. 4.—Raspberry. 5.—Gooseberry. 6.—Cherry. 7.—Apricot. 8.—Blackberry. 9.—Plum. 10.—Red Currant. 11.—White Currant. 12.—Black Currant. 13.—Apple. 14.—Pear. 15.—Damson.

THE APPLE.

Of all the productions of the vegetable world which the skill and ingenuity of man have rendered conducive to his happiness and to the increase of his enjoyments the apple stands forward as the most conspicuous. It is now a fruit crop of universal growth, and although the most beautifully sun-stained examples reach us at various periods of the year from Canada and California, and the temperate regions of our great Australian Colonies, for flavour none of them equal those grown in England. The garden apple is believed to have been introduced into Britain by the Romans, and the wild apple of our hedgerows is the type of the fruit when left to degenerate, and to which it would speedily return but for constant culture. The finer and highly-flavoured apples are used as dessert, and are often expensive; the juicy and hard-fleshed sorts are in request for culinary purposes, while those of a more austere nature are utilised in the making of cider, and not a few go into pulp for the foundation of certain brands of jam.

In regard to the general cultivation, the apple, whilst it will live in any common soil, thrives best in a soft medium loam, slightly impregnated with sand and overlying a well-drained subsoil. On such a formation the fruit attains full size, colour, and flavour, and the trees will be most productive, and continue to flourish for a long period. Yet there are certain soils and situations in every part of the country where perhaps some of the varieties named over-leaf have not proved successful. There are also many apples that gain local fame, and are unknown outside limited bounds. Upon investigation, it is often found they are identical with some well-known variety, and though our list does not pretend to include all the good apples, it has been compiled according to the votes given at the last Apple Congress, for popularity over the widest area in both sections.

DESSERT.

NAME.	SEASON WHEN RIPE.	
Devonshire Quarenden ..	July	August
Irish Peach	August	
Yellow Ingesterie	September	
Ribston Pippin	October	December
Cox's Orange Pippin	October	January
King of Pippins	October	January
Blenheim Orange	November	February
Scarlet Nonpareil	November	February
Claygate Pearmain	January	February
Court Pendu Plat	January	April
Sturmer Pippin	February	May
Fearn's Pippin	March	June

CULINARY.

Keswick Codlin	August	September
Lord Suffield	September	October
Ecklinville Seedling	September	October
Worcester Pearmain	September	October
Pomona	September	November
Stirling Castle	October	November
Nonsuch	November	December
Warner's King	November	December
Bismarck	December	February
Dumelow's Seedling ..	December	March
Prince Albert	January	February
Bramley's Seedling	January	April

Many of the sorts included in the dessert class are suitable for cooking, notably Blenheim Orange, and *vice versâ*, like Worcester Pearmain. Dumelow's Seedling is known under the name of Wellington in some parts of the country. Court Pendu Plat is popularly known as the Wise Apple, because it is one of the last to come into bloom, and on this account often misses the late spring frosts, thereby ensuring a certain crop of fruit.

THE PEAR.

Although there is a wild pear found in some parts of England, we have nothing on record to show that the luscious varieties now found in gardens have emanated therefrom; yet doubtless they come from a common origin in the course of centuries of cultivation. The fruit was certainly known to the great nations of the East, and most of the approved types have come to this country through Europe.

Gerard, in 1633, enumerates seven sorts, all of which, he says, and many more sorts of "tame peares," and those "most rare and good, are growing in the ground of Master Richard Pointer, a most cunning and curious graffer and planter of all manner of rare fruits, dwelling in a small village neere London, called Twickenham; and also in the ground of an excellent graffer and painfull planter, Mr. Henry Banbury, of Touthill Street, neere Westminster, and likewise in the ground of a diligent and most affectionate lover of plants, Mr. Warner, neere Horseydowne, by London, and in divers other grounds about London." This was the pear in olden times. As is well known, it is now grown as a delicious table fruit, also as an appetising cooking fruit, and again for the production of a liquor called perry.

Dessert pears are characterised by a sugary aromatic juice, with a pulp soft or melting, as in the beurres or butter pears. Kitchen pears should be large of size, with the flesh firm, neither breaking nor melting, and rather harsh than sweet. Perry pears may be either large or small, but the more uninviting the taste the better will be the liquor. We are most interested in it as a garden product chiefly for eating purposes. It is as easy to grow a good pear as a bad one; the difficulty lies in knowing what is really good. The amateur cultivator has many difficulties to deal with. He takes up a catalogue of fruits containing very many varieties, and as he may only require six or a dozen he is quite at a loss what to select from among the many glowing descriptions given. He ventures to make a selection, plants his trees, and when they fruit he is much disappointed. It is very difficult to name pears that will do in all situations. It may be done, but in such a list many of the best must be avoided, as what varieties will do in one position will not succeed

in another. A deep dry loam is best when the trees are growing on a stock of their own species, but a moister soil is preferable when the quince stock is employed. The soil may be 18 inches in depth. Gravel is a good sub-soil when the incumbent earth is suitable. Clay is a good subsoil, generally speaking, though it admits of great improvement and amelioration by draining. To prevent the trees from striking down into a formation of this nature, a great deal may be done to this end by a good preparation of the surface soil, sufficient elevation in planting, and by giving the roots a proper direction in the first instance at the time of planting.

"Though a loamy soil of medium texture is that in which the pear may be most successfully grown, yet almost any soil, with a proper and careful preparation, will support the pear tree in good health, and enable it to produce fair crops of fruit." Soils of this nature seldom require any artificial drainage, the natural texture and composition of the subsoil being such as to admit the percolation of moisture with sufficient freedom. On the other hand, heavy, adhesive soils, approaching to clay, require the greatest care and attention in draining in order to prevent the stagnation of moisture beneath the prepared surface. On these soils trees must be planted high; for it is under such circumstances that the roots become most injured by deep planting, which is far less felt on light porous soils.

EATING PEARS.

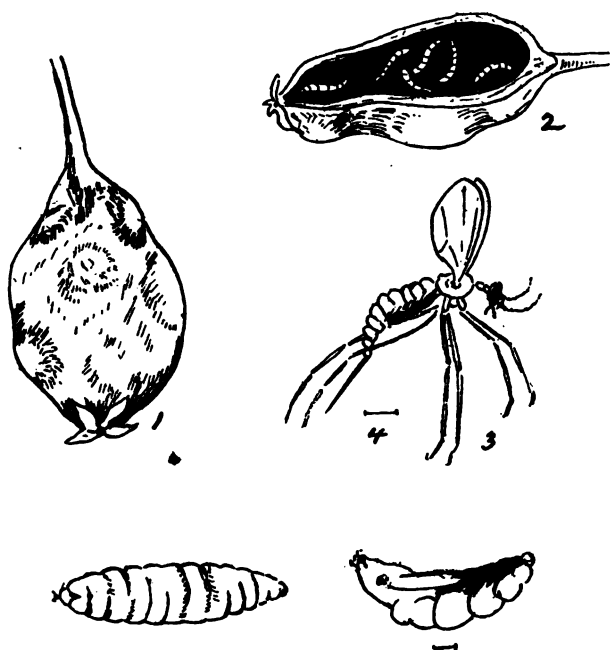
NAME.	WHEN RIPE.	SUCCEEDS BEST AS A
Doyenne d'Eté	July	Bush or standard
Beurre Giffard	August	Tree or wall
Bon Chrétien	September	Standard or wall
Beurre d'Amanlis	September	Standard or wall
Fondante d'Automne	October	Standard, pyramid, or wall
Louise Bonne of Jersey	Oct. & Nov.	Tree, espalier, or wall
Glou Morceau	November	Bush, espalier, or wall
Doyenne du Comice	December	Wall, espalier, or pyramid
Beurre Diel	December	Bush, pyramid, standard, or wall
Winter Nelis	January	Pyramid, espalier, or wall
Josephine de Malines	February	Bush, espalier, or pyramid
Easter Beurre	March	Bush, pyramid, or wall

STEWING PEARS.

Beurre Capiaumont	October ..	Pyramid or standard
Vicar of Winkfield ..	December	Pyramid or bush
Catillac ..	February	Bush or standard
Uvedales St. Germain	April ..	Bush or espalier

The above-named pears are sufficient for any ordinary garden, and the list includes some of the best varieties in cultivation.

The seasons of ripening are averaged, and may be varied according to weather and local influences in soil and situation. The first early pears are fit for gathering when they part readily from the tree. Those which ripen in winter should stay on the trees as long as the weather permits, or they will shrivel. All should be carefully handled and the fruit kept in a cool place.



The Pear Midge.

1.—Withering fruit. 2.—The same cut open showing maggots. 3.—Female insect. 4.—Natural size. 5.—Larva. 6.—Pupa. For further particulars see page 36.

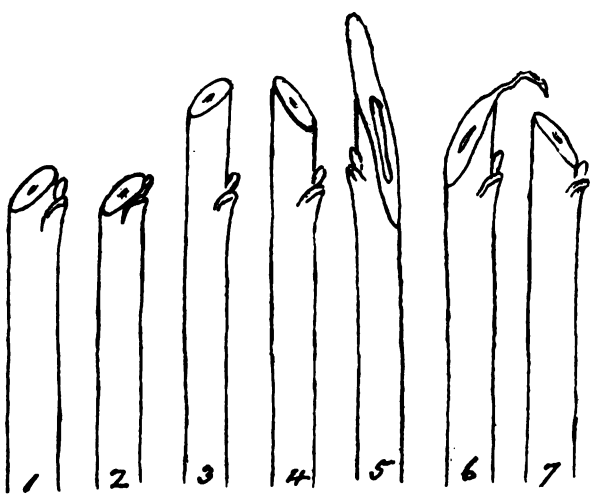
THE PLUM.

There is no fruit tree better fitted for cultivation in the gardens of those not well versed in the subject than the plum. As with most other fruits, we have our native types, believed by some authorities to be the originals and by others purely wildlings degenerated from one or other of the better-class varieties that were brought to this country from the Continent centuries ago. Be this as it may, the plum seems to succeed in all forms of growth and in many situations. Although hardy, it is unfortunate that the blossoms should be so liable to get injured by late spring frosts, particularly when the trees are exposed to the north and east; yet if rationally treated some kinds may be depended upon to give a heavy crop regularly every year; and it is also possible, by a judicious selection, to have a succession of fruit during quite three months.

Whilst the same plums can be used for dessert and cooking, the list recommends them individually for whichever purpose they seem best fitted, and we particularly class the freestone sorts as adapted for culinary purposes—by this term is meant those in which the flesh readily parts from the stone. The test of merit, however, in dessert plums is a melting and luscious flavour, and in cooking plums juiciness and rich flavour. For making tarts it is not necessary that the fruit should be ripe—indeed, they are sometimes richer when used for this purpose soon after they commence to colour, and the thinning-out is often advantageous to those remaining on the trees.

Name.	Colour.	Season.	Size.	Quality.	Recommended for
Czar	Purple . . .	July . . .	Large .	Cooking	Wall.
King of Damsons	Purple . . .	Aug. . .	Medium .	Cooking	—
Superb . . .	Green yellow .	Aug. . .	Medium .	Dessert	Wall.
Victoria . . .	Red	Aug.-Sept.	Large .	Cooking	—
Greengage . .	Green . . .	Sept. . .	Medium .	Dessert	—
Jefferson Gage .	Yellow and Green	Sept. . .	Large .	Dessert	Wall.
Pond's Seedling.	Bright red . .	Sept.-Oct.	Large .	Cooking	Wall.
Monarch . . .	Purple . . .	Sept. . .	Large .	Dessert	—
Golden Drop .	Yellow . . .	Oct. . .	Medium .	Dessert	Wall.
Primate . . .	Purple red . .	Oct. . .	Large .	Cooking	—
Grand Duke . .	Purple . . .	Oct. . .	Large .	Cooking	—
Bullace . . .	Green . . .	Oct.-Nov. .	Medium .	Cooking	—

Most plums succeed as standards or pyramids, and a few require a wall, particularly in exposed places. Some growers advise lifting and replanting pyramids and bushes every three years, but the custom is only recommended under special circumstances. Moderate root pruning is beneficial to all the fast-growing kinds, and pyramids or bushes so treated and summer-pruned under proper advice are generally fruitful. In the warmer districts plums on a north wall produce large and handsome fruits, which come in for use after the general crop is over, and by netting they can be kept still later; in the north all the choicer kinds are preferable on a wall. It is usual to plant bushes not less than six feet apart; pyramids not less than ten feet apart; spreading wall-trees fifteen feet apart; and standards not less than fifteen feet apart. Directions for planting fruit trees will be found on page 30.



How to cut a tree or bush.

1.—The correct way. 2.—Too close to bud. 3 & 4.—Too far from bud. 5.—A very amateurish cut. 6.—A blunt knife leaves a ragged edge. 7.—Another bad style.
See also page 2.

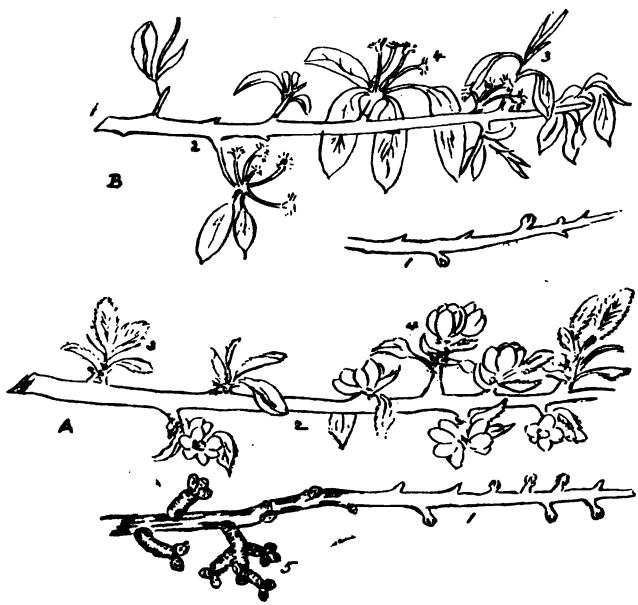
THE MANAGEMENT OF FRUIT TREES.

If a fruit tree or bush is permitted to grow at random year after year, without being pruned and thinned out, it becomes in the course of time no better than a wildling, and its fruits deteriorate in both quality and quantity as quickly as its yearly growth extends. The art of pruning chiefly consists in being acquainted with the nature of bearing in different species of trees, and the best means by which their fruits can be produced in the highest excellence, whilst the object of pruning is to check all exuberant growth and useless branches, to induce the formation of fruit buds in place of leaves. It is surprising how easily useful knowledge can be acquired by a little study of the trees at different seasons.

There are two periods of the year at which the operation of pruning fruit trees and bushes is performed, viz., winter and summer. Winter pruning is necessarily done at a time while the trees are at rest, *i.e.*, the period which follows after the leaves have fallen and previous to vegetation breaking out into new life—and this will generally be found to date from early in December to early in February, according to the state of the weather. To prune trees after vegetation has made a start, except in the case of summer pruning, when the fullest extent of the season's growth is reached, may result in the trees receiving a considerable amount of damage. Where trees have not been properly attended to the instruments required for the operation are a pruning-knife, mallet and chisel, and a hand-saw. For all garden trees that have received regular attention, the knife plays by far the most important part. A good pruning-knife should be made of the very best steel, and possess a considerable curve in the blade, to enable the operator to lay well hold of the wood.

The amateur should bear in mind to begin the cut on the opposite side of the stem to the bud, about the same level as its point, and the cut should finish a little above the bud (see illustration page

2). This, if done properly, will make a perfectly clean cut at an angle of 45 degrees. By making the cut in this manner the bud is uninjured, and will burst into growth readily enough when the proper time arrives. Should the cut be made too far from the bud—*i.e.*, too high above it—the wood will die down to the bud,



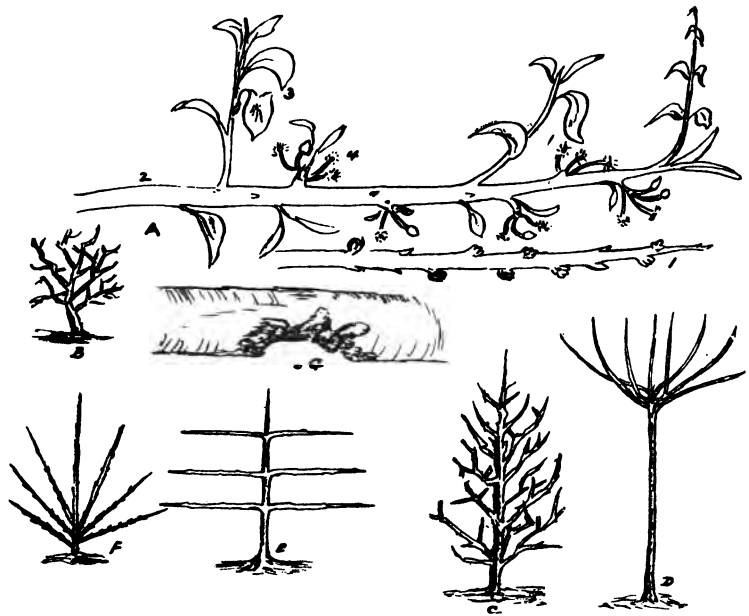
A.—Branch of espalier apple in leaf and bloom. 1.—Same branch in winter previous. 2.—In spring. 3.—Wood bud in leaf. 4.—Bud in bloom. 5.—Fruiting spurs on older growth. B.—Branch of espalier pear in leaf and bloom. 1.—Same branch in winter previous. 2.—In spring. 3.—Wood bud in leaf. 4.—Bud in bloom. 5.—Fruiting spurs on older wood.

and this will require another application of the knife where one should have sufficed. In this latter case the bud is greatly weakened, and consequently its growth is far less vigorous. In removing a large branch, where the saw has to be brought into use in place of the knife, the cut should afterwards be made perfectly

smooth with either the knife or chisel, and covered with grafting wax, or clay and earth mixed together.

The apple and pear bear their fruit upon small terminal and lateral spurs, or short robust shoots which spring from the young branches of two or more years' growth. The terminal fruit buds are the first to appear and the first to bear, and of all trees in cultivation the fruit wood of the apple remains in bearing for the greatest number of years. (See illustration page 11.)

With an old orchard apple tree the chief point is to keep the growth of the past season shortened. This shortening must be in proportion to the strength of the shoots; strong ones may be shortened one-third of their length, weak ones one-half or two-thirds, and very weak ones may be shortened into two or three buds. Cut out all decaying, cankered, and dead wood or barren stumps, which will not only give the trees a neater appearance, but will also much improve their health, by allowing a free circulation of air and sunshine to every part, and by displacing all useless leaves and small sprays, which it would otherwise have to support, and which would rob the fruit of a great share of its nourishment. On all the branches the young wood should be encouraged and the old and useless cut out, so that the tree may be fruitful in every part. Trained apples will be somewhat similarly treated, except that the young wood should be encouraged in every direction, cutting out all old and useless branches. Comparatively young and vigorous standards, pyramids, and bush trees should be pruned back to within from 5 to 8 inches of their bases; each of these pruned back shoots will push forth four or five young growths the following spring. These, when likely to become crowded or to cross each other in growth, should be pinched to within 2 inches of their origin. This will result in the formation of fruit buds, and with the same object, in addition to promoting a balance of growth in the trees, the strong leading shoots should annually be pinched two or three times during the summer and early autumn months, and the weaker ones once. The check thus given will not only result in the formation of blunt-headed fruit-buds, but also in that

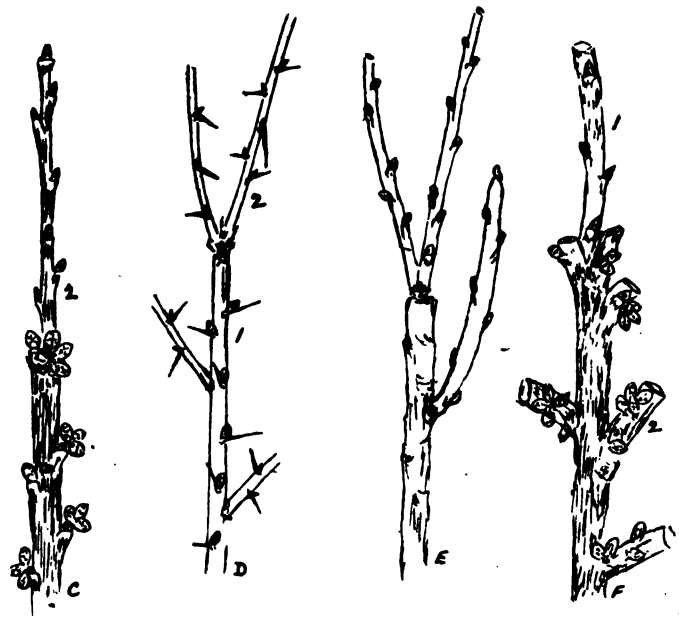


A.—Branch of plum on wall. 1.—Same branch in winter previous. 2.—In spring.
3.—Wood bud in leaf. 4.—Bud in flower. B.—Bush fruit tree.
C.—Pyramid fruit tree. D.—Standard fruit tree. E and F.—Trained for wall or espalier.
G.—A cankered apple branch.

of plumping the intervening or pointed wood-buds, a circumstance which will naturally lead to the production of better growth the following year than could otherwise be obtained. These low growing trees are by far the easiest to manage and the surest croppers, as their build enables the pruner to get the fruit upon sturdy branches, which defy the wind and weather to a much greater extent than standards, which are only recommended for orchard work when the undergrowth is required for grazing.

Plums produce their fruit on small natural spurs, which are situated at the ends and along the sides of the bearing shoots one year up to four or five years old. In most varieties branches are two years old before they carry a crop, and the same branches and spurs will continue in bearing for a number of years. A spur is a short pointed growth readily discerned when looked for on old trees; they sometimes come in clusters, when they should be thinned out, but let it be noted that the fruit that is produced on the young wood will prove to be much superior to that which matures on the spurs. Thin out old and useless wood so that plenty of air and light can reach all parts of the trees. It is recommended that all outdoor stone fruits be pruned as early as possible in the winter, and it should be noted that they resent too severe pruning. (See illustrations pages 2 and 13).

Cherry trees in general produce their fruit upon small spurs from half an inch to 2 inches in length, which proceed from one, two, three, or four year old wood. New spurs will continue to shoot out right up to the extremes of the branches, and this should be remembered when pruning. Except in situations where the cherry tree grows very grossly, it is as well to use the knife very sparingly on any branch for the further development of which there is room. Morello cherry trees trained on a north wall being of slender growth, and fruiting on the previous year's wood, require more time and skill to train properly than either the plum or pear, by reason of the great numbers of shoots which have to be manipulated. The peach and the nectarine bear their fruit on the young wood of the previous year's growth, the blossoms rising immediately from



A winter illustration.

C.—Branch of cherry showing fruit buds. 2.—New season's growth. D.—Branch of gooseberry showing fruit buds. 2.—Part of last season's growth. E.—Showing old and young growth of black currant. F.—Red currant. 1.—Part of last season's growth. 2.—Showing fruiting buds.

the bud. The same shoot seldom bears in the second year, except a casual fruit or two on adventitious spurs which appear towards its base. In pruning this tree, therefore, the whole aim must be to secure a succession of yearling wood. This cannot be too strongly understood by beginners, who are too apt to leave wood which is really past bearing in the hope that it may carry one or two more. The shoots at the end of the principal branches should not be stopped unless unusual strength carries them out of bounds.

The fruit of apricots is borne on the young growth of last summer, and also upon short growths called spurs found on two or three year old branches, and the chief object of winter pruning is to cut away the useless wood that is not furnished with plenty of young growth or promising to do so, and into the blank spaces caused thereby train in the young and fruitful wood. Though the most delicious of our preserving fruits, it is unfortunately rather slow in coming into bearing, and is also very subject to a disease called "gumming," which causes large branches, and even whole trees, to die suddenly.

With respect to the winter treatment of currants, gooseberries and raspberries, I refer readers to my notes under the heading of summer pruning. Some writers would have us believe that great skill is requisite in pruning to ensure good crops, but beyond cutting out and judiciously shortening branches that are too thick, thinning the centre of the tree, and removing suckers, there remains little else to do, especially so in the case of black currants and gooseberries. In districts where birds are numerous it is best not to do the work until the hardest of winter is past, as they are very fond of eating out the buds if frosty weather prevails, and if the whole growth is there, the damage is not so great as when they attack pruned trees.

Training Fruit Trees.

The best sorts of fruits capable of coming to perfection in the British Isles are reserved for the walls which surround most well-

appointed gardens, and, indeed, the principal object in thus sheltering gardens is the production of such fruits, which without some protection would not ripen in this uncertain and variable climate. Whilst solid bricks are preferable as the background for wall-trees, because they absorb so much warmth, we are opposed to old brick walls full of the nail-holes of a century, as these harbour insects to such a degree as to frustrate all hopes of keeping them down. In such circumstances it is advisable to have the trees so affixed that they can be readily released each autumn, when some composition can be brushed into the wall so as to seal in the vermin. A useful mixture can be made by mixing 4 oz. of soft soap in a couple of quarts of hot clear lime water, adding half a pint of paraffin. Well stir, and dilute to make a pailful.

The object of training wall or trellis fruit trees consists in so arranging their branches that the foliage may be more fully exposed to the influence of light than when permitted to grow in a natural state. Training, assisted by pruning, keeps in check the tendency of the trees to make an excess of wood in place of the formation of fruitful buds. The fan shape is the simplest method, and answers nearly every purpose in general culture on walls or trellis of peaches, apricots, plums, cherries, and even pears and apples, but we are no advocates of that precise adherence to the extension of the branches in an exact straight line, radiating from the main stem, so often shown by illustrations in gardening books. This generally requires a good deal of twisting about, inducing gum, canker, and frequently the death of the branch. Previously to the training of any tree for the purpose of obtaining the greatest quantity of fruit the gardener should note how and where the blossoms are produced on established examples, and how the fruit matures. The veriest amateur can soon grasp the ways of Nature from the action of the trees themselves.

THINNING.

What is termed the setting of fruit is its appearance after the fall of the blossoms in its proper form, and gradually increasing in growth. If the blossom has not been supplied with sufficient food

Illustrations showing how various fruits are produced.

1.—Gooseberry. 2.—Raspberry. 3.—Black Currant. 4.—Red Currant. 5.—Morello Cherry.
A.—New season's growth.

for its proper nourishment it cannot perform its functions so as to form the fruit. In order, therefore, that it should set well, the bearing branch must be healthy, but even then a long spell of cold and wet weather will prevent the organs of the flowers doing their duty, and consequently they will wither away. Some recommend that an over-production of blossoms on a fruit tree is detrimental, and that they should be thinned out. This seems to us a very laborious operation, and it is far easier to thin out the young fruits themselves when they appear so thickly clustered as to interfere with one another's growth.

DISBUDDING.

Disbudding is another operation in connection with fruit trees undertaken by the experienced gardener in the spring, and it appeals peculiarly to trained trees on walls or under glass. The object is to pinch out with the finger and thumb all those pushing buds that would furnish unnecessary branches, and which, if left to themselves, would have to be cut away in winter when the general pruning is done. Now, the philosophy of the practice is obvious. By preventing the tree from developing superfluous shoots, its strength is clearly husbanded and thrown into those branches that remain, which are rendered stouter as well as better capable of bearing fine fruit and equally vigorous new branches in the succeeding summer. The operation is generally undertaken when two or three leaves have formed on the new shoot. Sometimes several strong growths will appear coming out of the main stem and take an upward direction, and others may shoot out straight. All these should be cut out, if they are not wanted. Where disbudding is systematically carried out it lessens the work of pruning later on.

With regard to apples and pears on espaliers and plums on walls, these should not be operated upon until it is clearly distinguished which is a fruiting spur and which is likely to develop into a shoot. The spur usually forms a sort of blunt, knotty point with a few leaves round it, and shows no disposition to extend into a shoot. Watching developments at different seasons soon teaches the distinction between one form of growth and another.

It is common experience to find fruit trees in small gardens producing a wealth of growth, with an abundance of foliage, but no

fruit. A good deal has been written in recent years upon this unfruitfulness in confined areas, and various are the plans that have been tried to remedy the defect, with different degrees of success. If a tree has been planted in suitable soil and undergoes a regular system of pruning, it should under ordinary circumstances come into bearing in regular course. A thin, light soil often induces this productive stage earlier than does a heavy or retentive one, because the roots are frequently kept nearer the surface, whereas when they go down into a deep, cold strata of earth the tree is likely to become unhealthy, and little or no fruit is the result. It seems by some means to absorb into its system a force which expends itself in leaves and branches in place of blossoms, or, may be if some bloom does appear in the spring, it is unfertile. This is often experienced with the pear. In hot countries, where the apple does not under ordinary conditions find a season of rest, it is the custom to draw away the earth from the main roots at a certain time and let them lay bare and exposed. The check given to the vitality of the tree is supposed to exercise a somewhat similar effect on its constitution as the rigours of winter do in our climate; yet it seems a drastic proceeding, for surely Nature never directed the exposure of roots which she studiously hides from sight. This brings us to the matter of pruning, which, in a sense, may be defined as "systematic mutilation," bringing with it in the case of plants a form of maturity, a stage in all things that is the period of reproduction; and so it is, in connection with some recognised system for keeping the root growth foraging vigorously near the surface, that good crops of fruit can be expected.

SUMMER PRUNING.

Summer pruning, when judiciously performed, is one of the greatest aids towards the successful cultivation of fruit in the open air, for when growth becomes active, it is necessary to ensure a development or curtailment of certain shoots that will induce the formation of fruit-producing wood the following season. The work of thinning the young shoots of bush, espalier, pyramidal, and wall trees should be done so as to secure the fullest advantages, and be of daily occurrence, that is to say, a little should be done each day, and then the vital functions of the remainder is assisted to discharge themselves more completely. If trees are permitted to carry

their whole natural free growth, they will soon become crowded, and instead of producing fruit of fine quality, it will be small in size and poor in flavour, and only appear at the outer edge of the tree, and not equally distributed as it does when the growth is kept well balanced by judicious pruning, and light and sunshine have free access to all parts.

Some time during the month of June a thicket of shoots will be seen springing from each tree, particularly those on walls, the new growth trying to reach the top; these vigorous shoots draw the strength from the lower branches, and should be checked. The centres of trees or bushes growing in the open will be found so thick that light can barely penetrate, with the result that the main lengths of the branches are destitute of fruit-buds. With such trees the most judicious course would be, not to cut these shoots off wholesale, but to well thin out those most in the way, by degrees, and shorten those that will remain to about four leaves. I complete pruning by the August holiday in a normal season. By allowing the sun to have free access in summer instead of waiting until the trees are dormant, a season may be gained, as the heat will exercise its influence on the foliage whilst in active growth, for no elaboration of the strength of the tree, towards producing fruit-buds, can take place whilst enjoying its winter rest. With what are termed bush or pyramid trees the case is somewhat different, as they are more easily got at, and one great advantage of thinning in summer is that what may appear a favourable distance apart for the branches whilst the foliage is off, presents a different appearance when the trees are in full vigour. Other robust growths I shorten to about five leaves. Trees which are carefully pruned during the leaf season certainly require to be looked over in the winter, but only to thin out a growth here, and shorten a shoot there, to balance the formation of the tree.

Pear trees trained in the espalier form are often encumbered with strong shoots in front of the main branches. These must come off as the strength they absorb is required in the framework of the tree. Pyramid pear trees, showing robust growth, should have the strongest shoots shortened back to six leaves, then during August a general shortening of most of the growth back to four leaves. It occasionally happens in the case of apple and pear trees fully established, and in a bearing state, that some branches become useless, or may be devoid of fruit spurs; when such is the case, a well-

Summer Growths on Apple Trees.

A represents a summer shoot which, if not wanted, is cut back in July at 2. B represents a similar shoot with prospective fruit buds at each joint. Some of these buds may produce a further leaf growth later in the summer (see C). These laterals should be cut back as shown at C 2 at end of summer. Other growths also come out of the older wood, induced by the check caused by pruning. D illustrates one of these called a natural spur. The other growth (see E), is generally a wood shoot, but like D, often carries fruit the following season. A professional gardener often finds it advisable to cut back C at the point marked F in winter, and the two eyes left will probably produce fruit.

placed young shoot should be selected from near the bottom of an old branch, and kept at full length, to supply the place of the old branch, which will be removed at the next winter pruning. Also in any part of the tree where there appears to be a want of young shoots to replace the old and worn out, or diseased branches, or where the wood is too thin, fail not at this time to make the necessary selection. The terminal young shoots should, in fully established espalier trees, be trained at full length, and only shortened when the object is to produce more than one shoot for the purpose of filling up the space on the wall or espalier.

The sum and substance then of the summer pruning of pears and apples is to ensure bloom buds, and to check too luxuriant growth of every side shoot, or at least all that are not required to be left to increase the size of the tree, should be shortened to about 5 or 6 inches, beginning about the end of July, and at the top of the tree (this is important) to about one-third of the way down; then in about five or six days prune the second part, which is the middle of the tree, and finally the third or lower part of the tree in five or six days after the second pruning.

Peaches and nectarines are only sparingly grown by amateurs, as they require to an extent some amount of special knowledge in culture. All superfluous branches should be shortened to three leaves. Each fruit branch should be left with two wood buds at the base, and if these shoots are in front of and above the branches, and have grown, say, 6 inches long, they should be pinched back to 3 inches, but if below, let them reach a length of a foot before stopping. It is advisable to encourage some of the new shoots that come from the centre of the tree, and train them into blank spaces for ultimately taking the place of worn out wood.

In the apricot it is indispensable to be able to distinguish those shoots likely to produce fruit, for if they are taken out a season's crop may be lost. The wood bud is full, and when about 4 inches long it is terminated by a sort of bunch-like head, made up of a series of leaves rolled round each other. Such shoots as these should be pinched back very short. The fruit-bearing shoot is thinner, redder, and seldom more than 5 inches long, and without the leafy termination found on the other. Such growths must not be stopped too severely. The final pruning takes place

in September, and any growth then appearing out of place may be cut back to three leaves.

As regards plum and cherry trees, thinning out weak branches and shortening very rampant growth in August is all that is necessary.

Healthy fruiting bushes of white and red currants, black currants, and gooseberries do not need nearly the same severe summer pruning recommended by some writers. The best system to follow is that of the market gardener—a man who has to make a living out of his crops. With the white and red currant in the open ground he shortens the side shoots of the past season's growth at the winter pruning to three leaves, sometimes stops the main shoots, and cuts away any old wood or young useless shoots in the centre of the bush, but in summer he rarely touches the trees beyond pinching out any curled points infested with vermin, and his fruits hang in thick clusters. With the black currant his aim is to keep the old black wood in check by cutting it back to where a new side growth commences, thin the centre, encourage the strong young wood, and shorten any shoots of the past season's growth that get out of bounds. The gooseberry, he thins out the centre in winter, and sometimes shortens sidegrowths, but hardly touches the fruit-bearing branches, which arch over in summer with their heavy load of berries. He likes to keep the bush on a single stem, and grubs out all useless suckers that come from the roots. As the bush gets larger it is necessary to thin the branches to keep them in a given space, and sometimes to shorten them to keep the tree in proportion. With the raspberry he permits about five of the present season's rods to mature, the weak ones are removed at the base. He would like to cut away the cane which bears the season's fruit after the crop is taken, but it is a busy time; consequently its elimination does not take place until winter. It is all fudge about it protecting the young and tender growth, which is sufficiently matured to take care of itself by the time the cold weather is reached.

Some recommend raspberry canes to be cut down to less than a foot from the ground the first spring after planting. There is some wisdom in the advice if exhibition fruit is wanted, but everyone does not desire such fine quality, which is often only sparingly produced. If the canes are shortened in spring, say to 2 feet or a little more, according to their robustness, a very good crop may be expected

without any staking. It is always best to top robust canes, as some are certain to get out of bounds.

ROOT PRUNING.

For ages gardeners have endeavoured to prune the tops of trees into fruitfulness, and much slaughter is annually carried on with the knife, often without beneficial results, for it has been found that too severe pruning frequently strengthens growing force by concentrating it into a smaller area.

Then came the fashion of root-pruning. So long as a tree makes plenty of fibrous roots it remains fruitful, but directly large woody roots are developed and strike downwards into a cold, deep soil, it becomes unhealthy, and it is then that a judicious pruning turns the strength fruitwards instead of running away to wood. Against this recommendation there are various opinions entertained and expressed as to the benefits or otherwise of root-pruning, some contending that it is not necessary, and does harm; while others, again, hold just the opposite view. The advocates for it have a good case, as there can be no question but that it throws young trees into bearing quick; this says much in favour of the practice, as none of us care to wait long after planting before we get fruit.

It often happens that fruit trees on walls and in other positions, after being planted two or three years, get into such a vigorous and gross state they more resemble a rampant, wild tree that the firm and short-jointed form generally looked upon as the precursor of a plentiful supply of fruit. To depend upon the knife, as usually applied to such trees for subduing their unruly luxuriance, is not always advisable; for while their roots get the full benefit of a freshly-made soil without check or hindrance, so long will they continue to renew their gross growths, as they penetrate more deeply, and get further from the influence of sun and air.

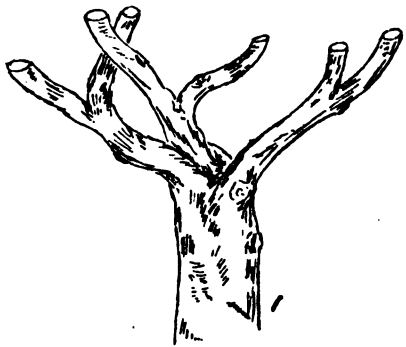
It shall be decided then that the operation is often a necessity, but not to the extent generally practised, especially upon large trees standing in the open, and with the opportunity of producing plenty of top growth. Many lift their trees biennially, considering it desirable; some modern gardeners affirm that an established tree

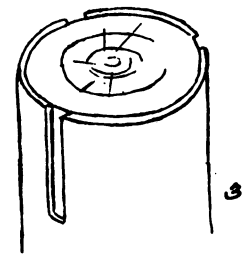
does not require lifting unless it shows a tendency to gross vigour and unfruitfulness; and training fails, because the latter often brings with it, the second season, a good show of fruit, whilst unnecessary lifting causes failure. If an extra crop of fruit be left on gross trees, it sometimes proves beneficial in regulating the sap, and by such means checking exuberant growth.

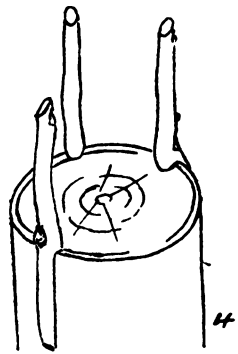
Transplanting has the same effect as root-pruning, but in most cases the check is more severe than is necessary, and yet, if conducted carefully, it often does a great deal of good. For trees that have stood long, and have not been interfered with below, it is a good plan to only go half round them one season, and leave the other half to be operated on the year after. This gives them a chance to recover, as the several roots will have healed at the points and made a great number of fibres, which at all times it is desirable to encourage and increase, as they lead to the formation of fruit buds. As regards the distance from the main trunk, it is not recommended to cut closer that 4 feet, and if advisable to put in some fresh soil, let it be a good mixture of loam, lime rubbish, and ashes. On light and dry soils young trees scarcely want touching with the knife the first year, particularly if a hot summer follows the season when they were planted.

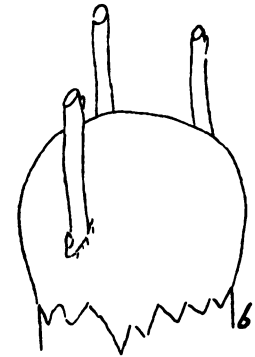
Renovating Old Fruit Trees.

When fruit trees become stunted and diseased, either from old age, bad soils, or unskilful treatment, they should either be grubbed out and young ones planted in their stead, or, as is more commonly the case with those possessing a little knowledge on the subject, the old trees are headed down and vigorous grafts inserted from healthy trees, or, to use more simple language, it means the splicing of a bit of the tree you want to the one that is useless. In performing this operation the head of the tree should be cut off down to, say, three limbs in a careful manner with a saw if they are thick, the cut being made in a sloping direction, and rubbed over with wetted soil; it is not, however, an absolute necessity that every branch should be cut away in one season, as some prefer that parts of the tree may be left to bear its own kind in preference to being without fruit that year. This system particularly applies to apples, pears and plums, and is usually undertaken late in February or early in March, or as soon as the genial influences of the solar rays induce the sap to become









Grafting old Fruit Trees (see p.p. 26 and 27).

1.—Old tree cut back. 2.—Graft. 3.—Inlet for three grafts. 4.—Grafts set in. 5.—Grafts bound. 6.—Grafts plugged.

active. It is important that the stock should be in advance of the graft, and as it is difficult to push this action in the tree forward, it is usual to keep the grafts back—that is to say, the latter are cut at once, nice, healthy shoots of last summer's growth preferred, full of buds, with little sign of starting; the lower ends of these are laid into the ground, out of doors, with some protection, so that they are not exposed to either frost or much wet until they are used. They can remain for two or three weeks in such a place, and will be found in fit condition for service when required. The work must be very carefully undertaken, because if tight adhesion does not take place between the stock and the graft they will be liable to subsequent disunion. Great care must also be taken that they are both placed exactly in contact with each other, so that the line of separation of the wood and bark should, in both stock and scion, be accurately adjusted.

The period or season for grafting is somewhat regulated by the state of the weather, and the sap of the stock should be in active motion at the time. This will be perceptible by the buds commencing to break. The methods of grafting are many, every gardener having his own fancy style, that known as crown or rind grafting being, perhaps, the most popular for renewing or altering the heads of old and worthless trees. It offers the advantage of producing early and late sorts on the same tree, which will extend the fruiting season when the size of the garden does not admit of many trees being grown. Crown grafting is the system generally followed on the Kentish fruit farms, but in the Midlands it is the custom not to head down to the main limbs, but some of the younger branches are left, and to these the grafts are affixed. After a graft is inserted the stem is bound with binding material, such as gardeners use for tying plants, and a thick coating of some composition put over the whole. Various are the preparations used for the purpose, but all that is wanted is some material that will exclude the air and remain on until the graft has either taken or failed. Some use a mixture of three parts clay and one part horse-dung as cover.

It will be seen from the illustration on page 27, that there is nothing very perplexing in the operation; the chief thing to be remembered is that the parts of graft and stock must be cut so that they fit closely together, either in a niche or on a flat surface. The clay covering, retaining a certain amount of moisture, keeps the

graft fresh from the drying air and the effects of winds. If the work is cleanly done Nature will soon do the rest. We have seen the grafts on trees treated in late winter bearing fruit in June, but of course it should not be permitted to remain. The operation may be performed upon trees of almost any age or size with tolerable success.

To those who have never seen grafting done this account may not be very intelligible; let the amateur, then, try to see it once performed, and he will understand sufficient of the process to grasp the details and act accordingly. Applying the ball of clay to the graft is the worst part—it is called "plugging" by professionals. The reader can imagine what it is to mix a cold, earthy preparation with the hands on a raw day in March. It would absolutely freeze any one not used to it, and make him thoroughly disgusted with one phase of the "pleasures of gardening." It is best to let a horny-handed man undertake this work.

In looking over a nurseryman's catalogue of fruit trees readers frequently find it stated that such and such a tree or bush is grafted on the quince, paradise, or crab stock. As trade terms these particulars are understood; they are also by the professional gardener, but to the amateur not having graduated in the mysteries of the art of producing a standard plum, a pyramid pear, or a bush apple, the statement is most perplexing.

By one who knows little it would be assumed, upon the question being put to him, that fruit trees are grown from seeds or cuttings. In special circumstances such may be the case, but generally it is not so. A fruit tree grown from seed would take years to reach the fruiting stage, even if it ever does so, and they do not always come true; that is to say, the pips sown from a Blenheim orange apple do not necessarily produce a facsimile of the parent, but often some mongrel type of little value. The tendency of Nature is to revert back by degrees to the wildling of the hedgerow. To save time, then, the experts resort to grafting; that is, they affix by approved methods a piece (called the "scion") of the recognised variety they desire to perpetuate on to the already established "stock," say, of the common paradise apple, which is a compact habited variety with

fibrous roots, and when a suitable type is treated in this manner, the growth both in branches above and roots below can be kept within bounds. This stock would not do for some very robust growing apples, which are grafted on to either "wild crabs," or what are called "free stocks," produced from common apple-pips. In the case of plums, something similar is adopted, the common musse plum being most frequently employed as the root foundation. Pears are mostly grafted upon the quince stock or some common pear, peaches and nectarines on the pear-plum or common plum. All these stocks are grown by nurserymen in large "breaks," so many years in advance of the period when they will be operated upon. Some from seeds or stones, others from "layers"—a sort of cutting will answer its description for the present purpose. It will be gathered from these particulars that the fruit tree, as purchased, is not the work of a single season, but has to be taken in hand by the nurseryman some years before it reaches the state in which it is fit for planting in gardens.

The kindred nature of all plants is surprisingly shown by the power and effect of their growing and fructifying when grafted on each other, one organisation attaching its vascularity to that of another, and thriving on its sap, without apparently showing the slightest change in the characteristics of either its blossom or fruit.

Hints on Planting Fruit Trees.

With suitable distances for planting the various kinds.

Standard apples and pears, for orchards, 25 feet apart.

Pyramidal apples and pears, on the apple and pear stocks, 12 feet apart; should be root-pruned occasionally.

Pyramidal apples and pears, on the paradise and quince stocks, 8 feet apart, the same, if root-pruned, 6 feet apart.

Bush apples and pears, 7 feet apart, and if planted by the side of walks should be 3 feet 6 inches from the edging.

Apples and pears, trained horizontal cordon fashion for the edging of walks, should be on the paradise and quince stocks, and planted 1 foot from the edging, and trained 1 foot from the ground.

Pears, on the pear stock, on walls trained fan or horizontal, 20 feet apart.

Pears, on the quince stock, on walls trained fan or horizontal, 10 feet apart.

Apricots, fan trained on walls, 14 feet apart.

Cherries, fan trained on walls, 12 feet apart.

Peaches and nectarines, trained on walls, 14 feet apart.

Plums, fan trained on walls, 15 feet apart.

Raspberries, gooseberries, and currants, 4 feet apart.

The best planting months are when the trees are dormant and can readily be lifted and if necessary packed for a journey. It ranges between November and February, but the best trees are generally those procured early.

The Royal Horticultural Society have recently issued some useful instructions regarding the important operations of planting fruit trees the chief points of which are embodied in the following notes. The best time for planting all fruits is October and November. Just digging a hole, cramming the roots in, shovelling the soil over, stamping it down, and leaving it is the wrong way to plant, and can only result in failure. The correct method is to take out all the earth to a depth of 18 inches, either in a square or circle of at least 6 feet across. Well break up the earth below the 18 inches with a fork. If the roots are in any way jagged or torn, cut the points cleanly off with a sharp knife, and shorten back all straight downward roots. Place the tree in the hole at such a depth that when the planting is finished it will be at the same depth as it was in the nursery, which will be seen by the soil mark on the stem. The depths should be such that the highest roots will be about three or four inches below the surface when the planting is finished. The roots will generally be found to be growing from various parts of the stem. Spread out the lowest roots carefully on the soil and scatter a little fine earth over them; then spread out the roots next above these, adding more soil; then those above them, and so on, giving a little shake now and then to let the soil run in between the fine roots. When all the roots are spread out and covered, give the tree a good, vigorous shake, add a little more soil, and then tread it in firmly (not hard) and fill up the hole slightly above the surrounding soil, as it will sink one or two inches. Put a strong stake to the trees, and be sure that the way the two are fastened together is such as to make it impossible for the stem of the tree to chafe itself against the stake when the wind blows.

If the natural soil is very poor, a little better garden soil may be brought for shaking in amongst the roots, just to give the tree a good start, but no dung whatever should be used under the ground. It is very important not to plant too deep, especially in sodden or heavy land. In very wet land it is a good plan to plant the trees almost on the surface, and to mould the earth up to and over the roots. Spread out all the roots down to the smallest fibres, and none should be allowed to take a directly downward direction, but every one duly spread out, slanting very slightly downwards from the point at which they grow out of the stem. When they get down into an uncongenial soil the fruit is certain to be scabby and spotty. The soil should not be left loose about the stem and roots, but firm treading does not mean hard ramming. Fill up the hole two or three inches above the level, and do not leave a hollow for stagnant water to fill. State the tree firmly.

The old-fashioned table-topped shape is the best type of tree for windy districts and the neat-growing pyramid, bush, and espalier forms are also serviceable. All the large fruiting apples—like Lord Suffield, Ecklinville Seedling, and Warner's King—should be of the three latter shapes, not only on account of the wind, but for easy access of picking.

It is better to lay the tree in, just lightly covering the roots up with soil, for a week or so, than to plant in wet, sticky weather. No turf should be laid over the roots of newly-planted trees; but keep the ground clean from weeds, and lightly stir it at intervals for two years all over the surface, two or three inches deep, to let in sun and air. Neither is it advisable to cram a lot of crude manure round the stems when planting, particularly in heavy soils, but use it on all soils as a top-dressing the following spring. These directions apply to all kinds of fruits.

Storing Fruit.

The gathering and storing of fruit is an operation to which sufficient attention is seldom paid in small gardens. It is the common practice to allow most fruits, when ripe, either to fall of their own account or be shaken from the tree. Fruits left upon the tree until full ripe often lose much of their flavour; besides, however good the precautionary measures may be to keep them there, any

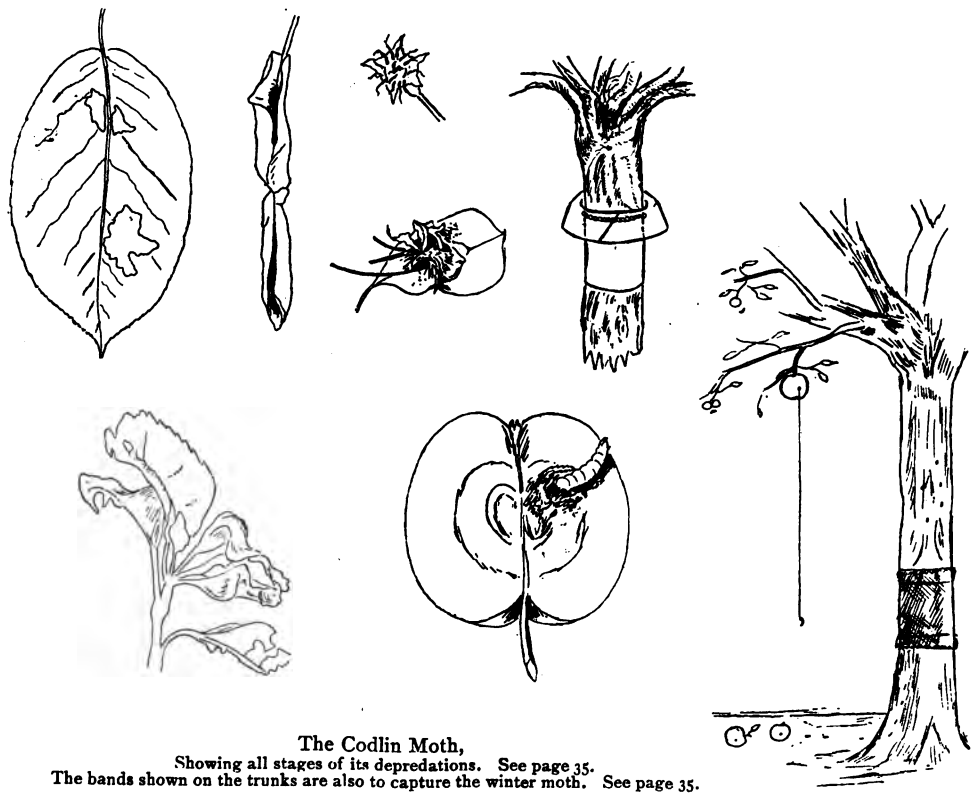
that may fall get so bruised as to be unfit to keep beyond a few days. Most fruits part readily from the tree when about to ripen, particularly the plum and pear. Another criterion of ripeness with the apple and pear is when the seeds inside the fruit have become a black-brown colour; if they are white it is not ripe.

There is a practice too common of making a general sweep at once of the fruit from the trees. They should be taken off gradually, those facing the sunny side, or on the outer branches, will probably be fit some week or so before those less favourably situated. Winter pears are often gathered too soon, and the consequence is that they quickly commence to shrivel. If ladders are used it must be with care, because if either the stem or leading branches get barked or bruised it will very likely cause canker, which is a terrible scourge on apple trees.

In the storage of fruits, a cool, even temperature is necessary, and the specimens must be set out in a single layer upon open wooden shelves or trays. Some of them may become covered with a sweat, when a current of air through the room will help to dry a good deal of it away. This is part of the natural process of maturation, but unless checked with a dry air, it sometimes affects the fruit so that a weak spot will soon turn rotten. Go over the stock about twice a week, and remove those which show the slightest signs of decay, and handle the sound ones as little as possible.

Fruit Tree Pests.

Horticulture is a pursuit which, perhaps more than any other, is dependent upon related sciences, for a man who pretends to understand gardening should be a botanist, an entomologist, a geologist, and a chemist, and if there is one branch more than another which most assuredly needs his careful attention it is entomology. Insects enter into all a gardener's plans and calculations, and he is engaged in a continual warfare against them from one season to another. His success depends upon method in tackling the foe, and a knowledge of the enemy's tactics is half the victory. The increasing presence of vermin has been largely brought about by the dry hot summers and the comparatively mild winters experienced during the past few years. Here is a short account of a few that severely punish common garden fruits.



The Codlin Moth,
Showing all stages of its depredations. See page 35.
The bands shown on the trunks are also to capture the winter moth. See page 35.

The codlin moth, which probably does more mischief than all other pests put together, chiefly attacks apples, and makes its appearance in May and June, flitting about the trees in the evening and early morning, and laying an egg on the side of every well-formed apple that comes in its way. Within a fortnight a tiny caterpillar is hatched out, and immediately commences to bore into the apple, generally near the eye or at the side when two fruits are close together, and works its way down to the pips, upon which it feeds. When it has cleared out the available food it does not return by the way it came, but makes its course in another direction, and either drops with the fruit or lets itself down by a thread to the ground. It then crawls to some convenient spot, under a clod or up the main trunk of the tree that has reared it, and here it makes its nest under the loose bark and remains until another season, when, as a moth, it carries on the work of mischief, later broods causing what are known as "worm-eaten apples." Bands of sacking placed round the trunk and examined every week from June to November are often used with success, but scraping and washing the old bark is more effectual.

The wingless females of the winter moth crawl up the stems of fruit trees from the autumn to late winter, and deposit eggs on the twigs and branches. From these, caterpillars are hatched in the spring, for which the leaves and blossoms serve as foods or, glued together, as secure dwelling-places. These caterpillars are often of the same colour as the material they are found upon, and are troublesome to find. When fully grown they let themselves down to the ground by a thread and make a nest under the surface, from which the moth emerges in the autumn to lay her eggs. There are other moths related to the species, but this is the most troublesome. The chief method employed to defeat this pest is to place a piece of greased sacking round the trunk of apple and pear trees in autumn and winter just below the branches, and overhaul it occasionally There are also special preparations sold for the purpose.

Ermine moths are on the wing during summer, and generally lay their eggs upon the branches of apple and pear trees, but they are not at all particular in this respect, as they are often found in hedge-rows. The caterpillars first appear during May, gathered in colonies, and covered with a veil-like web, and devour every sign of leaf that comes in their way, sometimes clearing a whole tree. When full-grown in July they spin themselves a cocoon, and a few

weeks later the moth appears. The best means to destroy this pest is to collect the colonies by hand and crush them. If not carefully managed they will all drop to the ground upon the slightest disturbance. There are several species; one of them breeds a solitary caterpillar, which hatches in the autumn and remains under a waxlike covering through winter, coming out under the influence of spring warmth to make its home curled up in a roll of leaves, sometimes dragging in a few withering flowers.

When pears reach the size of marbles in June they are often found thickly strewing the ground. This state of things is due to the work of a fly called the pear midge, which appears in April, the female of which lays its eggs upon the unopened blossoms—that is to say, she pierces the petals and then deposits on the reproductive organs inside as many as twenty ova in a cluster. Within a week the maggots appear, and soon make their way to the inside of the fruit, and here they remain and develop until about the middle of June, when the fruit begins to sicken, and falls to the ground, often with the maggots inside. They then bury themselves in a covering and remain until they develop into flies. Collecting and burning the fallen fruit may account for many, and liming the surroundings of the tree may destroy others (see p. 7.)

A small black or brown sluglike creature is often noticed upon the leaves of pears, plums, damsons, and cherries, which is called the pear and cherry sawfly. This represents one stage of the existence of the fly, which appears in May and June, lays its eggs upon the under surface, from which this slimy insect emerges within a fortnight. It is generally found lying upon the upper side of the leaf fully exposed to view. It lives upon the tissues of the leaves, and in about a month it assumes a more inviting form and crawls down the tree, remaining under the ground in a grub state for some time. There may be several broods during the year. They sadly interfere with the health of the tree when in great numbers. Digging and liming the ground around is adopted as a means of eradication, and spraying with strong washes after the flowers have set has also proved serviceable.

The apple-sucker, a minute insect, which sucks away the life from the leaves and blossom-buds, is one stage of a small, dull yellow hopping-fly seen under the leaves all through the summer.

The female lays its eggs at the end of that season, mostly on the young wood, but sometimes in cracks of the old bark. These remain until spring, when a creature emerges which finds its way into the blossom-buds, and lives on the juices, causing the flowers to shrivel and fall off. In about a month this insect develops into a winged fly, which lives through the summer. Spraying the trees directly the apples have been picked is recommended as a remedy, whilst all winter prunings should be burnt.

The apple-blossom weevil attacks the blossoms of apples and pears. It somewhat resembles a beetle with a snout, and comes out of its winter retreat behind the old bark, early in spring, the female making for the budding blooms, in each of which it lays an egg. Out of these a maggot is hatched within a fortnight, which immediately attacks the organism of the flower, causing it to wither. After some days it forms a nest in the withering material, and within a fortnight a beetle-like insect emerges. These are supposed to live on the leaves until summer is on the wane, when they hide for the winter. As a preventive any means that will keep the tree clean are likely to check this pest.

Apple growers often notice bunches of a woolly or cottony substance on the stems, branches, and twigs of apple trees, especially upon scars and cracks where the bark has been injured, or where side shoots and branches have been cut off in an unskilful manner, so that wet has collected and caused decay. Upon examination, the white substance on these will be found to consist of little groups of insects in various stages, some of which are clothed with fine woolly coverings, and are actively engaged in piercing these denuded surfaces with their suckers. The infestation spreads rapidly, and young apple trees are frequently so injured that they die. The effect of this attack is sometimes wrongly attributed to "canker." As methods of prevention, apple trees should be kept free from mossy and lichenous growths, which serve as shelters for these and for many other injurious insects. These growths can be killed by rubbing finely powdered lime over the trees during the winter in damp weather, so that the lime adheres. Sulphate of iron dissolved in water, at the rate of 1 lb. to one gallon of water, and sprayed over the trees in winter by means of a powerful garden engine or hop-washer will also kill lichens and mosses.

When the woolly aphis is discovered in wounds and scars on the stems and branches, these places should be treated in the late autumn or winter with a thick compound of soft soap and paraffin oil, mixed in the proportion of one gallon of paraffin to one and a quarter pounds of soft soap and nine gallons of water, worked into the cracks and scars with a stiff brush. Infested boughs and trees should be syringed at the same period with a mixture of one pound of soft soap and one gallon of paraffin oil to twenty gallons of water. In mixing the paraffin washes, the soap should be dissolved in hot water, and the paraffin put in whilst it is hot, and the whole incorporated into a cream with a hand-pump or syringe. Cold water may then be added in proper proportions. During summer linseed oil may be brushed into the affected parts. Spraying just after the fruit is set is also recommended as a good check to many pests. It does not necessarily kill them, but, making the available food distasteful, they die of starvation.

The black currant mite has been working great destruction in recent years in both gardens and field plantations. It seems to make its home in the buds, which swell and become diseased instead of pushing out leaves, and it is curious to note that the old-fashioned variety does not appear nearly so susceptible as the improved kinds. There is no effectual remedy beyond burning all bushes upon which it is seen and cultivating a new stock unaffected with it.

Directly the raspberries are in bloom a little moth may be seen flying about the canes. It is finding nests for its eggs in the flowers. In about a week's time the caterpillars are hatched, but they are not supposed to do any injury at this stage, as they merely come out to take a look round instead of feeding. They afterwards go down to the ground, and "lie low" until the following spring, when, according to entomologists, they again crawl up the cane, get into the bud, and feed in a manner which makes up for the lengthy fast. They then make a nest in the pith of the cane, and in about three weeks the moth emerges. Then there is another grub often found in the fruit when over-ripe. It may be a near relation to the last-named, but so far I have not been able to learn much about it.

Canker is a fungoid growth (see illustration page 13) which chiefly attacks apple trees in this country. It generally gains admission to the living portion of a branch through a wound in the bark, occasioned, perhaps, through frost or a bruise, injuring the bark when tying or staking, climbing the tree, or rubbing it when using a ladder, and seems to spread with alarming rapidity on trees planted in a hot, dry gravel soil. It eats away the bark and otherwise affects its welfare. Many of the pippins get sadly infected. Where the branch cannot be conveniently cut out the best remedy to check its depredations is the solution of 1lb. of sulphate of iron to a gallon of water to be applied with a brush. This mixture will also destroy moss growing on the trunks.

Fruit trees are subject to many diseases, on the causes of which a great diversity of opinion prevails. A common impression among gardeners is that "they come in the air," while those who consider themselves more philosophical observers laugh at the notion of atmospheric influence, and attribute the whole mischief to the entomological enemies of human industry. Perhaps both theories are to a certain extent correct, although it is difficult to see how the atmosphere can produce insects, whilst it may occasion their development and multiplication. As many country gardens have orchards attached that suffer from the depredations of vermin, it will interest our gardeners to read the advice on winter washing of fruit trees lately issued by the Board of Agriculture, whose special permission we have to make use of the chief points.

A neglected orchard not only harbours various insect enemies during the winter, which come out in the spring and commence their ravages, but it forms a nursery or breeding-ground from which others are invaded by noxious insects. It is essential that all such orchards should be treated in some way to stop the damage that is caused by the various insect pests they encourage. For this purpose a caustic or burning wash known as caustic alkali wash is most successful. This mixture serves a double function. It removes, by means of its caustic properties, all vegetable incumbrances, moss, and lichen; and, at the same time, it causes all rough and decaying bark to fall off. A tree so treated soon assumes a more healthy appearance. By the removal of the moss and lichen from the trunk and limbs, the favourite quarters of many hibernating insects are destroyed.

Beneath the vegetable growths and rough bark on fruit trees may be found during winter the woolly aphis, apple-blossom weevils, earwigs, codlin maggots, thrips, and numerous other small insects. The destruction of their winter quarters will place these often serious pests in unfavourable circumstances, and they cease to increase in abnormal numbers. Scale insects, of which two at least are more or less harmful in this country—namely, the apple-bark louse or mussel scale, and brown currant scale—may also be destroyed by this wash.

Not only are moss and lichens and the insects referred to above destroyed or stopped from excessive increase, but the wash acts also in another way by attacking the eggs of certain species. Groups of the eggs of the apple-suckers treated with it are killed, as also are those of the red spider and those of certain aphides. Spraying the wash over eggs recently laid has little effect on them, but when the embryos are nearly mature the majority of those mentioned are destroyed.

To prepare caustic alkali wash, place 1 lb. of commercial caustic soda in water, then 1 lb. of crude potash as well. When both have been dissolved mix the two well together, then add ¾ lb. of common treacle, stir well and add sufficient water to make up to ten gallons. As the wash has an irritant effect on the hands, care must be taken in employing it. The best time to paint the trees is about the middle of February, as some insect and mite eggs are then more liable to be affected than earlier in the winter, and it is not too late to harm any developing buds. Every old or young orchard where moss, lichen, and woolly aphis have a firm hold should undergo this treatment, which has a most beneficial effect, not only in clearing the trees of moss and rough bark, but indirectly in lessening insect attack.

As a further antidote against pests that infest fruit trees a good soap is effective in destroying soft-bodied insects. The soaps made of fish oil, and sold as whale oil soaps, are often especially valuable, but variable in composition and merits. A soap made with caustic potash rather than caustic soda is recommended, as it yields a liquid in dilution more readily applied and more effective against insects. For plant lice and delicate larvæ, a strength obtained by dissolving half a pound of soap in a gallon of water has been found sufficient. Pyrethrum powder acts externally on insects through their breathing pores, and is fatal to many forms

both of biting and sucking insects, but is not poisonous to man or the higher animals. Its chief use is against household pests, and in greenhouses and small gardens, where the use of arsenical poisons is not advisable. It is usually applied as a powder, preferably in the evening, so as to be retained by the dew.

Against many plant mites, such as the red spider, flowers of sulphur may be used, preferably in the form of a powder when the foliage is damp. Sulphur is most successfully applied as a wash combined with paraffin emulsion. Flowers of sulphur is the best form to use. The standard remedies against aphides and scales are emulsions of kerosene or petroleum with soap. The crude oils are said to be valuable against many pests, but the greater safety of the emulsions has resulted in their general adoption, as the pure oil, especially if carelessly used, may result in serious injury to the trees. The following are proportions recommended for the kerosene emulsions: Kerosene, two gallons; whale oil soap, ½ lb., or soft soap one quart; water one gallon. This must be afterwards diluted. It is prepared by first dissolving finely-divided soap in boiling water, and then adding it immediately, boiling hot—but away from the fire—to the kerosene. The whole mixture is then churned up. After three to five minutes' mixing the emulsion should be perfect, and the mixture will have assumed the consistency of cream. If well made it should keep indefinitely. If the water in any locality is hard, it should be softened; or a milk emulsion is suggested instead. For this two gallons of kerosene are mixed with one gallon of sour milk. Heating is unnecessary otherwise the emulsion is prepared in the same way as the former. The change from a watery liquid to a thick buttery consistency, much thicker than with the soap, takes place very suddenly after a few minutes' churning.

During the growing period of summer, for most aphides and other soft-bodied insects, the emulsion is diluted with from 15 to 20 times the quantity of water, and for scale insects with from seven to nine times the amount of water. In the case of red spider and other plant mites, the weaker mixture is used, with the addition of 1 oz. of flowers of sulphur per gallon. The emulsions should be sprayed over the plants immediately upon the appearance of the insects. The application should be just sufficient to wet the surface, without allowing the liquid to run down the trunks of the trees. Care must also be taken that the emulsions are sufficiently diluted. as if used too strong they may injure the trees.

TREES AND SHRUBS.

What can be more beautiful than trees, with their graceful play of wide-spreading branches, and all the delicate machinery of buds, leaves, flowers, and fruit that with more than magical effect burst forth, from naked and rigid twigs, with rich and varied colours, breathing odours, pure, fresh, and healthful? Trees have commanded admiration in all nations and periods of the world. What is the richest garden without trees? What barren and monotonous spot can they not convert into a paradise? Of what roadway, avenue, or woodland walk do they not enhance the charm? Many of our readers, though fond of gardens, will learn, perhaps, for the first time, that trees are cheaper than flowers, and that at the expense of not many shillings they may plant a little shrubbery or make a rural screen for their study window of Laurestinus, guelder-roses, bays, arbutus, ivy, virgin's bower, honeysuckle, or even the poplar, horse-chestnut, birch, sycamore, and plane-tree. But if the lover of Nature has to choose between flowers or flowering shrubs and trees, the latter, in our opinion, would be preferred, inasmuch as they give a retired and verdant aspect to a place, and call to mind something of the quiet amplitude of Nature.

John Evelyn, a celebrated arboriculturist of a past century, spent a considerable portion of a valuable life in endeavouring to communicate his admiration of trees, and, besides immediately effecting a great national service by turning the attention of the Government to the importance of planting, has left a fine monument of his taste and labour. In spring, when they are in the delicacy of their pride; in summer, when they are shadowy and aromatic; in the last splendour of autumn; or when winter robs them of their foliage, but brings to light what summer has concealed, the underwork and tracery of their branches—at all times are trees delightful.

It is getting quite the custom with builders in the suburbs of cities and large towns to decorate the gardens of new houses with trees, and sometimes with shrubs, but in too many instances the incongruity displayed by an ill-assorted assemblage, possibly picked up cheaply at a sale, is quite out of character with the surroundings of the place, and particularly is it noticeable if the intending occupier possesses a taste for gardening.

We will discuss the propriety of distributing a selection in such situations, which from their distinctness in habit and foliage are likely to add a charm and please the most fastidious. In a sense it is unfortunate that so many of the most beautiful ornamental trees are deciduous—that is to say, they lose their leaves in the autumn, yet it would be unreasonable to expect delicate foliage to remain during the severe weather experienced in winter in this climate. First may be named the variegated Maple (Acer negundo variegata). On a fairly dry soil, in a somewhat sheltered place, this effective tree, which is obtainable in bush shape or as a standard, is very ornamental, its almost white, airy foliage contrasting splendidly against the more sombre greens. Its Japanese relation (Acer Japonicum) includes a greater range of colours in the foliage, and are amongst the most handsome things obtainable in this direction. The Tree of Heaven (Ailantus glandulosa) is another beautiful thing of rapid growth; indeed, in some places it is found advisable to curtail its branches each season, so that it may form a suitable habit without occupying a great deal of space. Catalpa Bignonioides and its golden companion (C. aurea) are both highly ornamental. There is nothing like its fine heart-shaped leaves and curiously marked flowers, and it forms a striking object in the Paris boulevards, mingled with the common maples. Purple beech (Fagus purpurea) is very distinct, its rich bronze purple foliage rendering it a fine addition to our coloured leaved trees. The tulip tree (Liriodendron tulipifera), when given plenty of room, becomes quite an object of beauty. It produces a flower resembling the tulip. Among the Sumachs, Rhus glabra laciniata and R. typhina are both exceedingly pretty, the leaves turning in autumn to all the richest crimson hues imaginable, whilst the smoke plant (R. Cotinus) always attracts attention in roomy gardens. The rose acacia (Robinia hispida) is one of the very

best. Its delicately-cut leaves give it quite an aristocratic appearance, either as a single standard or planted as a shrub in avenues or borders. The maidenhair tree (Salisburia adiantifolia) when well grown is one of the most distinct of garden trees, its foliage resembling the well-known maidenhair fern. Weeping willows are very effective when planted near a lake or running stream. The weeping elm, weeping birch, weeping ash, weeping sophora, and mountain ash are all welcome objects in this category, and should be extensively planted in suitably situated gardens.

It is amongst such tall growing or spreading things as these that room should be found for bushy shrubs, some evergreen and berry-bearing, such as produce their fullest beauty during the dullest months of the year. Foremost is the winter flower (Chimonanthus fragrans), a curious shrub, producing its highly fragrant flowers on leafless stems, which are cut and used largely in house decorations. The Naked Jasmine (J. nudiflorum), another pretty thing, mostly grown as a climber, which seems to defy both the rain and the fog, blossoms in winter. The golden-yellow stars dotted along the full length in graceful sprays have a striking effect. The Laurestinus (Viburnum tinus) is quite a handsome shrub when smothered with myriads of white flowers at Christmas-time; even when out of bloom the foliage is very ornate. In dry, sheltered gardens the pretty Cornus capitata makes a showy evergreen shrub, both for its flowers and fruit, which resembles strawberries, and often hang through the winter, whilst the Cornelian Cherry (Cornus mas) produces clusters of golden-yellow flowers along its naked branches often as early as February. Stems of these cut off and placed in water when the buds are showing, open out, and are very effective in vases. The arbutus, which is very hardy, is another useful bush, with strawberry-like fruit. Hibiscus syriacus is a shrub that cannot be too freely planted in sunny places in towns. It is represented in many varieties, some with double flowers, but the whole family possesses no special feature in winter.

The magnolias deserve a place in all collections of shrubs. Some lose their leaves in winter, like M. conspicua, which becomes covered with large white flowers on bare stems in spring. M.

grandiflora, an evergreen species, is hardy in the South of England. M. stellata, quite a bush, is smothered with starry flowers about April. The Mezereon (Daphne mezereum), a useful and old-fashioned winter-flowering shrub, produces clusters of rose-coloured flowers upon naked branches, which are very much sought after for vases, and so is the deliciously fragrant Daphne indica, which is not quite so hardy. Clerodendron trichotomum, with showy foliage and white flowers, is very distinct. The evergreen Mexican orange flower (choisya ternata) suits light soils facing south. Myrtles, flowering currants, double-flowered cherries, almonds, peaches, cytisus Andreanus, lilacs, mock orange, weigela, forsythia, and kalmia, may be added as fancy decides. They are all beautiful, and represent pretty things that enliven a garden border in spring. Those who like catkins should procure a well-grown plant of Garrya elliptica, a handsome shrub in sheltered places. Then there are the wych hazels, of which Hamamelis japonica is, perhaps, the most curious, the naked branches being studded in January with pale yellow flowers, the petals of which assume a peculiar contortioned shape, serviceable to cut and place in vases. In Cotoneaster microphylla we have a very ornamental suburban tree, more especially in the autumn, when it is covered with clusters of scarlet fruit, and often seen overhanging porches and along the fronts of houses. Berberis aquifolium, known also as Mahonia, is a handsome shrub under taller trees, the winter tints of the leaves varying from crimson scarlet to deep purple. It is extremely hardy, and, like the spotted laurel (Aucuba japonica), will stand a good deal of ill-usage, thriving in the most uncongenial surroundings. As a cover plant in fowl-runs it is most useful when established, the branches forming an umbrageous canopy under which the birds rusticate with delight. As the spring comes the leaves resume their green, and soon after the points of the growth are covered with bright golden bloom, and lastly purple berries. Treated as an ornamental shrub, there is no plant so well adapted to enrich the heavy borders along the sides of carriage-drives or in front of a belted line of trees.

These are a few of many delightful ornamental trees and shrubs, not nearly so largely planted in suburban gardens as they should be.

Those about to plant may note the following particulars: Suitable trees for planting in London and other cities where the atmosphere is laden with smoke are the London plane, Ailantus glandulosa; whilst in the suburbs, horse-chesnut, catalpa, acacia, and mountain ash may be named. If the ground is not suitable for tree planting, holes six feet square by two feet deep should be excavated, and filled in with fresh loam from an old pasture-field. Great care must be taken to spread out the roots of the trees when planting, and if any are broken or bruised they should be cleanly cut off. Trees may be planted from November to March. They should be well staked, and have fine wire-netting fastened round the trunks, but not touching the bark in any part. The trees may be tied with cord to a supporting stake, and a layer of felt affixed between the trunk and the cord to prevent the bark from being rubbed. Wire should never be used to fasten the trees to the stakes, as it often causes serious injury.

SHRUBS AS UNDERGROWTH.

Tall and outspreading trees add much to the charm of a garden in providing a welcome means for the enjoyment of such beauty as the scene affords. During the hot days and cool evenings of summer time no accessory contributes more to the pleasure of the surroundings than a fine tree with a comfortable seat underneath it, and it is into such a spot that one can retire for refreshment and rest with the least amount of exhaustion and fatigue. Trees are far more efficient for shade than arbours and summer-houses, which often add to the heat by shutting out the breezes. Yet trees, particularly in small gardens, have their disadvantages from the fact that they shade portions of the ground where the presence of the sun would be welcome. Then, again, the roots absorb all the nourishment in the soil, which becomes sterile, and it is often difficult to get anything to thrive underneath them. With such trees as cedars and firs, the earth overshadowed will in time become absolutely poisoned with the terebenthinate substance contained in the particles of the foliage, dropping continually at all seasons of the year, besides, being surface-rooters, they leave little

in which other plants can live. It is rarely that grass can be made to grow under trees in confined spaces, although it is often seen thick enough in woodland walks and shaded glades, where no attention is given to it beyond the nibblings of rabbits, sheep, or deer.

There are a few low-growing plants that are often found of service when planted in such situations, but to keep up a healthy show of foliage under the drip and shade of heavy overgrowth requires some attention to the thinning and pruning out of surplus branches, because it cannot be expected that a neat, close-habited shrub is going to be happy when smothered by a dense canopy through which the light and rain cannot penetrate. It is certain to look weak and sickly, and when once this condition overtakes the shrub, it seems hopeless ever to expect it to carry a green mantle of leaves.

Here are a few shrubs and plants that may be found serviceable: Aucuba japonica (very pretty foliage), mahonia aquifolium (a most accommodating evergreen shrub which lives in a great variety of soils), box (a well-known evergreen), broom and furze (both likely to succeed in light, dry soil), cotoneaster, daphne, green euonymus, holly, St. John's Wort (with pretty golden flowers), ivy of many sorts, Portugal laurel, bay laurel, periwinkle (with blue flower), evergreen privet, sweet briar, dog-roses, yews, rhododendrons (where the top growth is thin and light), arbutus or strawberry tree, Laurestinus (full of flower in winter), and butchers' broom. Amongst other suitable flowering trees may be added the scarlet and white thorn, laburnum, lilac, guelder rose, mock orange, and flowering currant. Those who like to see flowers under trees in early spring should set clumps of bulbous plants in the autumn. Pretty things like aconites, snowdrops, crocus, and daffodils seem to revel in such situations, the more drips that fall from the branches the better do these bulbs like it, and they will come up year after year without trouble or attention. Attempts in this direction can be seen at the end of winter in some of the London parks.

Shrubs as Winter Decorations.

No sooner does the chilly breath of frost dim the glories of autumn than the gardener who seeks for perpetual decoration in his surroundings cleans away the unsightly litter and prepares the ground for the reception of material capable of resisting our winter cold. Anything green is preferable to the naked earth, and the more that can be had of variety in colour, the more pleasurable the gratification.

The plants employed for winter gardening may be various. We know one lady who decorates her flower-beds with an assortment of variegated, mossy-leaved kales, which are gradually thinned out and eaten by the time spring comes round; there is some amount of practical method in this fancy. Then, again, some hold to the opinion that it is Nature's desire that the soil should remain uncovered during winter, for, if smothered with growth, it is robbed of a fair share of the mechanical and manurial forces provided for its amelioration and enrichment. This may be so in the vegetable department, but the man who gardens for pleasure wants to see something brighter than the bare earth from his windows during the dreary months of the year.

Plants suitable for maintaining the gaiety of a garden from the first dawn of spring sunshine until the fall of the leaf in autumn are all that are sought after in an ordinary way, but there is no reason whatever why many showy things should not be in evidence during the dullest months of the year, and for that purpose nothing is finer than the many variegated hardy evergreen shrubs and certain bright-fruiting companions. There is a charming freshness about them, for they have for the most part attractive foliage, and are varied to such an extent in light and dark shades of green, and narrow and broad leaves, with gold or silver edges, that the number of real distinctions to be found in this remarkable class of hardy vegetation is almost incredible.

Take, first of all, the conifers, which include such pretty things as Retinospcras, Thujas, Thujopsis, Cupressus, and Junipers. In planting these in conjunction with small solid-leaved shrubs they exhibit a rich and elegant ornamental effect. Some are light

and feathery in appearance, others are finely clothed with fern-like foliage, others throw their branches out flat and fan-like, some are pendulous, some grow upright, but all are beautiful, and under natural growth nearly all assume pyramidal bushes. There are few nurseries which have not a good choice, and the best way is to see them and select such sizes and types as take the fancy. Many are obtainable in pots, which can easily be plunged into the beds for the winter, taken out in spring, and used in the decoration of stands, steps, or other places through the summer.

The variegated hollies are of value in gardens where there is room for them, but in small places they do not seem the correct thing. The arbutus is a handsome close-leaved shrub that forms a pretty diversity, both in style of growth and in its singular bayleaf foliage. It is known popularly as the strawberry tree, because it bears a fruit in winter like an oval strawberry. The Laurustinus can hardly be too much valued, as it comes into flower at the beginning of winter, and is a mass of white bunches until spring. The foliage is always pretty, and as it cannot well be moved in winter without sacrificing its flowers, it is best to procure it in pots and plant to permanent quarters in the spring. Variegated box is a shrub that bears a good deal of ill-usage; its minute leaves render it a contrast to everything near it. Aucuba japonica is valued on account of its rich marbled foliage, unlike anything else. The leaves are large, bright green, blotched with white and yellow, and though cheap, it deserves a place in this list, as it contributes much brilliancy to the winter garden. The yew is especially attractive in appearance, and adds one more to the remarkable contrasts of colour to be found in the shades of green, and there are also some variegated types. The golden Euonymus is also very effective. Golden privet, Andromeda Phyllera, Rhamnus, evergreen magnolia, and some of the veronicas, all these should be seen when the intending planter visits the nurseries. Many other evergreens might be mentioned, but the list has been confined to subjects adapted to gardens of suburban residents for striking effect and great contrast over small areas. In some localities one class of plant will be found to thrive better than another, so that, besides those which strike the fancy most, some knowledge of the adaptability to the situation should be gained, as the atmosphere as well as the

soil has a great deal to do with the permanent welfare of even these hardy things. Let the contents of the beds be uniform, and the plants be placed in them in a regular manner at proper distances, certainly not less than a foot apart.

Here are useful lists of such plants mostly obtainable in compact bushes, with varying shades of green, yellow, and white, and also a selection producing flowers. The whole group is peculiarly adapted for decorative work, either during the dull season, or they may be planted to remain permanently, as they are effective all the year round :

Feathery-foliaged, evergreen plants in various shades of green of compact growth, and very effective in beds or pots :—

Cupressus Lawsoniana.	Cupressus erecta viridis.
Cupressus macrocarpa.	Thujopsis dolabrata.
Juniperus tamariscifolia.	Juniperus Virginiana.
Retinospora plumosa.	Retinospora squarrosa.
Thuja Lobbii.	Thujopsis compacta.

Green Box.

The same class of plants, with gold, silver, or variegated foliage :—

Cupressus argentea.	Taxus aurea.
Thujopsis argentea variegata.	Cupressus lutea.
Retinospora plumosa aurea.	Juniperus Chinensis aurea.
Retinospora plumosa argentea.	Thuja aurea.

Gold and silver box.

Larger leaved evergreen and coloured plants for winter decoration out of doors :—

Gold and silver ivy.	Euonymus (green, golden, and silver).
Variegated holly.	Kerrya variegata.
Portugal laurel.	Ligustrum japonicum.
Aucuba japonica.	Veronica Traversii.
Sweet bay.	Osmanthus illicifolius.
Vinca elegantissima.	

As it will be a difficult matter for many to determine from the botanical names what these shrubs are like, it is recommended that intending purchasers should pay a visit to the nurserymen who make a speciality of their culture. The cost should range from 6s. to 36s. per dozen, according to size.

SHRUBS AND OTHER PLANTS WITH BERRIES.

A class of trees, shrubs, and plants deserving greater attention than they receive in suburban gardens are those of an ornamental character, which produce showy fruits and berries at a season of the year when the floral display has passed away. For shrubbery and lawn embellishment fruit-yielding shrubs are excellent, giving colour, warmth, and interest when all else has put on its winter garb. For table and room decorations other of these berry-bearing plants are very effective, and owing to their lasting qualities they are of much greater value in many positions than perishable flowers; indeed, the combination of bright berries with the more subdued but still lovely tints found in the foliage of many of our hardy trees and shrubs, gives a good relief to the eye from the vivid colours of any bright flowers that may be left among them. The mountain ash (Pyrus aucuparia) is a beautiful tree, bearing large clusters of red or orange berries; unfortunately, when grown in a confined garden its fruit seems to be among the first that the birds devour towards the end of summer, but when grown in a plantation, amongst other trees, the berries frequently hang for a long time, and are not taken until the hard frosts of winter are at hand. One of the most popular plants of this sort, and probably the easiest to cultivate for conservatory decoration in winter, is the orange-fruited Solanum (S. capsicastrum); it grows freely from seed sown in spring, or larger plants are ensured if sown in the summer for use the second winter following. There are other types of both bushy and climbing habits, with white, scarlet, and purple berries. Ardisia crenulata is an evergreen greenhouse plant, packed with oval soft scarlet berries, often remaining on the plant in good condition for from three to six months. The Indian shrub (Callicarpa purpurea) makes a handsome pot plant, the twigs being literally covered with blue-purple berries in the autumn.

Many of the capsicums, with curiously-shaped pods, both scarlet and yellow, make pretty pot plants for decorating the table in winter. The neat little coral plant (Nertera depressa) is both curious and beautiful, and makes pretty edging to the conservatory border in small pots. In appearance it looks like a mass of orange-scarlet beads laid over bunches of moss. It grows readily from seed, and requires plenty of light and water. The Japanese

grass-like plant (Orphiopogon japonicum), so often seen in gardens in Italy, where it is sometimes used in the place of grass, throws up spikes bearing clusters of turquoise-blue berries hidden away in the foliage. It is not generally known that the lily of the valley, when grown in certain situations, produces clusters of rich scarlet berries. One of the most showy of the hardy fruit-bearing shrubs is the wild guelder rose (Viburnum opulus), frequently to be met with in hedges in the South of England. There are many other members of this family equally as pretty with scarlet, blue, and black berries. Symplocos cratægifolius is a delightful shrub from Japan, which produces in plenty the most beautiful mazarin-blue berries. Many of the rose tribe, including the sweet briar, will fruit abundantly on some soils, whilst the hips of the hardy Japanese rose (Rosa rugosa) are very large, and grand for autumn decoration. The shrubby snowberry (Symphoricarpus racemosus), as its popular name implies, bears a white berry, which remains for some time, whilst another species is coral-coloured. Another showy white-berried plant is Cornus paniculata. The Japanese olive plum (Elæagnus longipes) bears showy red edible berries, whilst the scarlet-fruited elder (Sambucus racemosus) makes a handsome ornament in the border.

The holly (Ilex aquifolium), in its many and varied forms, is, perhaps, unsurpassed for general usefulness as a berry-bearing plant, for it is highly ornamental in foliage, too, and being of good substance, lasts for a considerable time. In the yellow-berried variety we have a fine and distinct contrast to the red and white species. Skimmia japonica is an excellent plant for winter decoration, the berries being produced in great abundance. The strawberry tree (Arbutus unedo), with its curiously-shaped strawberry-like fruit, is well worthy of culture where hardy border shrubs are in request. If placed in water, both fruit and flowers are wonderfully lasting. The butcher's broom (Ruscus aculeatus), although a native of Britain, is rather a neglected shrub; the berries are very pretty, and of an enticing hue of red. The female plants of the garden asparagus carry a profusion of red fruit in the autumn, and are largely used at harvest decorations. The crowberry (Empetrum nigrum), with its dark shining berries, is both a summer and autumn plant, but the fruit is too delicious and

tempting to be left alone by the birds for any length of time. Pernettya mucronata, a heath-like plant, is interesting and ornamental in its many forms where seasonable decorations are wanted, bearing clusters of fruit in every conceivable colour.

The daphnes are shrubby plants, cultivated chiefly for the perfume of their flowers, which appear in early spring, in some species, in advance of the leaves, and are followed by red berries. Gaultheria procumbens is a hardy, berry-bearing shrub; the fruits are scarlet and edible, and the plant is highly ornamental, with its white, pendulous flowers. The common privet (Ligustrum vulgare) and its accompanying fruit, arranged with other subjects, is very effective; even when intermixed with cut flowers in a vase the black shining berries show a splendid contrast against almost any colour. Benthamia fragifera is a first-class evergreen shrub for winter decorative purposes. The large, strawberry-like fruit is very ornamental, and displays quite a feature for several months. Aucuba japonica is another excellent hardy shrub, the berries on the female plant are large, and, like the leaves, of good substance, lasting for a length of time either in or out of water. Shepherdia argentea and Canadensis are ornamental shrubs, with silver-looking leaves, and an abundance of edible scarlet fruit. Cotoneasters in great variety are very ornamental during winter; in most of the species the fruit comes in clusters, and is variously coloured. They are well adapted for covering bare walls and fronts of houses, where the shining foliage gives a pretty effect when even the berries are not present. The evergreen thorn (Cratægus pyracantha) bears large clusters of scarlet berries, which will hang for a long time if not devoured by birds.

Hymenanthera crassifolia is a New Zealand shrub, bearing white berries in our gardens in the autumn; Kadsura japonica, a small Japanese shrub, with clusters of scarlet berries. Certain species of the honeysuckle (Lonicera) bear white, red, black, and yellow berries in the autumn. Maclura aurantiaca, belonging to the orange family, and useful for making hedges, bears a small orange-like fruit. Mitchellia repens, a creeping bog plant, has scarlet berries. Rhamnus of sorts have purple and black berries. Many of the barberrys (Berberis), highly ornamental, hardy shrubs, bear purple fuit in autumn. Billardiera longiflora, a climbing shrub, has very showy berries in September.

Celastrus scandens, or climbing waxwork, for covering arches, bears rich scarlet fruit. The sea buckthorn (Hippophoe rhamnoides), a splendid seaside plant, growing down to high-water mark, where the foliage gets splashed with the salt spray, bears clusters of bright orange berries towards the end of the year. Some species of the vine (Vitis) are very ornamental; one of them (V. heterophylla) bears clusters of turquoise blue berries. A dwarf plant, very suitable on rockeries, is the bilberry (Vaccinium), with its dark-blue or red berries.

THE RHODODENDRON.

The rhododendron is certainly the queen of evergreen shrubs, for none other presents greater claim than is to be found in its numerous qualifications, amongst which must be mentioned its compact habit of growth, its dark and luxuriant evergreen foliage, but most of all its magnificent formed trusses of bloom, varying from pure white to deep crimson, some being handsomely spotted, and as each truss of flowers has its background of leaves they serve to impart relief and give effect to the tints displayed. Yet, as seen in some gardens, it becomes a thin, hungry-looking shrub full of naked branches, through mismanagement—generally the want of water in summer. For the successful cultivation of the rhododendron it is necessary that the plants be perfectly hardy, and not liable to push their blossoms too early in spring, that the soil be light, upon a cool subsoil, and that the plants are never allowed to suffer for want of water. These conditions secured as a basis, success is attainable, but a little enlargement of these principles is advantageous.

As regards the kinds most worthy of being cultivated, there is now an ample choice of both the "Ponticum" and seedling types. The catalogues of the principal nurserymen afford good data for selecting, and when a beginner fears to trust his own judgment he will do well to apply to some known firm to choose for him. Then as to compost—popular opinion runs in favour of heather soil, or peat. When this can be readily procured use it by all means, but its employment is not indispensable. Rhododendrons may be grown to perfection without a particle. Decayed leaves, reduced to the condition of mould, or other similar vegetable

matter, with the addition of a little sand or chalk, form an admirable compost. From the rubbish-spot or yard contiguous to every garden, or from the surface soil of an old wood, excellent materials for the purpose can generally be procured. Independent of such mixtures, there is in most localities plenty of fibrous turf, which can be lifted from old pastures, which suits rhododendrons very well. If some rough manure, such as comes out of used-up frames, is at hand for mixing purposes so much the better.

In localities where a compost has to be made for a bed of these plants, the natural soil should be wholly removed to a depth of at least 18 in., and the bottom well broken up. A few inches in depth of the surface may in most cases be reserved to throw in at the bottom of the excavated space; it will assist the drainage and help to fill up. On light, dry soils it is necessary that the bed, when finished, is something below the natural level, to prevent as much as possible the escape of water by running off. Plants in beds of made soil should occasionally (say every three years) be taken up, the ground trenched, a portion of new soil mixed with the old, and the whole allowed to get a thorough soaking from the autumn rains before replanting. If these precautions are not attended to the plants are likely to become stunted from lack of moisture and exhaustion of the confined space. A dressing of well-rotted manure forked in around the plants yearly in autumn will be found a good stimulant.

All newly-planted beds, especially if the plants are small, should be frequently watered during the first summer, for if the ball of roots once gets thoroughly dry it is very difficult to moisten it effectually again. It is always advisable to soak them well in a tub of water before planting. As the plants go out of bloom in June remove all seed vessels; this enables them to throw all energy into the wood-making and bud-forming processes for the next season. It should be borne in mind that, although a rhododendron delights in moisture, it will not continue in health if its roots are immersed during autumn and winter in a stagnant pool. When beds are made in a very retentive soil, forming as it were a basin in which water will accumulate, to escape only by evaporation, much injury is likely to result; this must be guarded against by some kind of drainage.

In this connection there is another type that deserves passing notice. Few introductions of recent times have added more beauty to our winter flowers than the section known as greenhouse rhododendrons, used for decorating conservatories. These now produce colours and tints in their blossoms, which a few years ago it was deemed impossible to get, because the known varieties did not seem to offer the necessary features for inter-breeding. But the hybridiser found more working for him than the material under his hands seemed to warrant, for in many cases the new varieties produced by his skill, through crossing and recrossing different families, exhibit colours and forms so unlike either of their parents that it is only to be accounted for by some curious trait in Nature contributed to by his ingenious methods. The jasmine-flowered section of the rhododendron is a very beautiful and readily-cultivated race of greenhouse plants, and as many sorts are available in pots in the early autumn full of bloom-buds, they are valuable for forcing purposes. Those having conveniences at hand for increasing the stock may do so, as they are all tolerably easy to propagate if a small frame or handlight be placed in an intermediate house ready to receive the cuttings at the end of winter, and when so propagated they can often be flowered in pots in the ensuing season. Good stout cuttings of well-ripened wood should be taken and placed singly in small pots filled with sandy peat, after which they should be placed in a frame-like case and carefully shaded against sun, but not kept quite close at any time, the quantity of air given to them being steadily increased until, when rooted, the coverings are wholly removed and the plants put in 48-sized pots. Once good plants are thus secured there is little trouble with them, for even in the matter of repotting they do not require much attention; indeed, they will go for years without any change of pot, and flower profusely, whereas if frequently shifted they often get stunted in growth and shy to flower.

PRUNING SHRUBS AND ORNAMENTAL TREES.

The pruning of evergreen and deciduous trees and shrubs is generally performed immediately before growth commences, but is often undertaken when cleaning up in the autumn, and in the case of shrubs which throw out long growths in summer, it is then often needful to cut some of the luxuriant foliage back.

It is an operation too generally neglected, the consequence of which is the miserable dead-and-alive specimens so often seen in gardens under the charge of some casual man who takes little interest in their welfare, because the subject has formed no part of his education. All plants and trees cultivated for their beauty require, and should have, an annual pruning or arrangement of their branches, and it is performed according to the effect expected from them. Those cultivated for their flowers should have all wood removed that has a tendency to weaken the tree by an unnecessary profusion of leaves and branches. Those grown for their foliage have merely taken away all weak shoots, or stronger ones where they seem too crowded. Those possessing natural beauty in their shape only need the removal of branches that are dead or injured. It is often necessary to thin out the heads of large trees, and lop off boughs that have extended beyond prescribed bounds. Rambling plants, again, require also a regulation of their branches, removing such of the old as can be spared and shortening some of the younger wood, to ensure a succession of vigorous shoots to fill up blank spaces and furnish leaves down to the bottom. In well-arranged ornamental grounds this adjusting and pruning takes place every season, and that is why one never sees in such places a tree or shrub destroying its neighbour.

All necessary pruning of trees in towns and cities should be attended to early in the winter. The natural growth of the tree should be considered, and only the lower branches removed when they project so far over the roadway as to interfere with traffic. In narrow streets it is best to select some species that does not spread quickly. When the tree is sufficiently established, all branches to the height of 15 ft. should be removed close to the trunk. It is very desirable that competent men should be employed to do this work. During the dry weather in spring and summer the trees should be systematically watered—the newly-planted ones at least three times a week. A hollow should be left round the trunk so that the water can soak in and not run to waste. As the trees in the London streets are largely dependent upon artificial watering, it is of great importance that it should be regularly carried out. Any rubbish which accumulates should be removed, and the ground lightly stirred with a fork as often as

required. The ties should be looked at twice a year to see that the trees are not being injured by them, and any adjustments or renewals should be made which the growth of the tree may render needful.

If we are to believe the dictum laid down by some experts in the matter of pruning roses, the study of the peculiarities of the various types cannot be considered less than a profound science. No doubt there is a great deal to be learnt in this connection, and failures more often than not arise, because of the ignorance of the operator, who hacks and slaughters without the least regard to the requirements of the species or variety. It has been said that the enemies of the rose are legion; but, probably, their worst foe is the man who will not, with eyes in his head, observe, and in a measure study, the needs of Nature. Too much is done with the knife, and if a tax was put upon pruning knives it would save thousands of trees every year. The use of the knife, however, must not be despised, for when exercised with some amount of skill the most beneficial results follow.

Pruning has two objects; it should make compact handsome trees or bushes, free from weak shoots and dead wood. It is susceptible of three divisions, which are long, moderate, and close pruning. Some writers urge cultivators to watch and follow the habits of the wild roses in the hedgerows, which mostly produce their blooms upon long, straggling stems. Such advice may be all very well in large establishments where space is no object, but in the majority of suburban gardens this natural system is not always possible, and the chief necessity for ensuring neatness and order is the keeping of any excess of growth within certain bounds. The rose is generally pruned in March, yet much mischief is done by starting the operation too early in situations where the bushes or standards are exposed to searching winds, or of a tender description. Thoroughly established plants of the most robust varieties should be taken in hand first, whilst those recently put in should not be touched, if they require cutting at all, until the influence of April warmth has given an opportunity to the sap to become energetic; the new growth will then go on unchecked.

STAKING AND TRAINING PLANTS.

"Sticking plants" is an operation undertaken either when they are young and tender or of straggling habit, and cannot support their own weight. To stick a plant properly requires a good deal of knowledge and a certain amount of skill. We put it in this way, because we have known some gardeners, experienced so far as years go, who never could stick a plant to give it a decent appearance. The art lies in the fact that the stick should first of all be set in straight, and at a certain distance from the main stem—an operation that looks easier than it really is. The next point is to have a stick of the right length for the plant; and the third is to hide it as much as possible.

When an average amateur puts a centre stick to a pot plant it generally stands at an angle, and is usually a foot or more higher than the plant, so that the stick is the most prominent occupant of the pot. When a plant like a coleus or petunia requires a centre support the best side of the plant should face the operator. The nicely-pointed stick should be set in behind the main stem, about a quarter of an inch away, and hidden in the leaves, so that it is scarcely visible, and if painted green it will be less so. At whatever angle the stick has to be placed, it is important to fix it so that it will be hidden as much as possible. Then as to tying; a tie is usually fixed about every six inches or less if the stem is rigid. The material favoured by gardeners at the present time is raffia fibre, to be obtained at seed shops. To prevent slipping the tie is wound once round the stick and the two ends brought to the front, leaving room between for the stems to expand before the knot is made. The ends are then neatly cut off, and all is done that is needed. This tying material has lately been put on the market dyed green, which ought to prove advantageous if the colour does not fly. As to sticks, these can be procured in many sizes at a cheap rate from the seed shops either white or painted green—they are made of soft deal. Some gardeners prefer making their own sticks out of laths, the work being done across the knee during the slack time in winter. The sticking of plants for exhibition is quite the work of an expert, as a single specimen will sometimes take as many as a hundred, and they are often so neatly and evenly placed as to be almost unseen.

1. A neatly staked plant. 2. Very badly done. 3. A hideous custom.
4. A nicely staked Fuchsia.

Staking plants such as dahlias in beds and borders requires just as much care, and if nicely placed are of immense value in supporting the plant or bush. Usually they are like clothes-props, and stand out much higher than the plant will ever reach, and in some cases the objectionable sight is not sufficient in itself, but in the case of dahlias the stick is often crowned with an inverted flowerpot for catching vermin, just as if some other method less obtrusive could not be adopted. When rows of plants are staked all should stand the same height, and when looked down from either end they should be as straight as a line. This is working by method, and is a good means of gauging the capabilities of the man in charge. Pea-sticks are too often ranged in a very slovenly manner, with no regard to the height of the pea they are used for, and no distinction made between the short and the tall sticks, whereas if put in carefully they are almost as pleasant to look upon as the crop they are intended to support. Neatness and order are often large factors towards success in gardening.

The various methods adopted for training flowering and ornamental foliage plants is one of those details that should command a considerable amount of interest from all who have an eye for taste in art as well as for the most beautiful in Nature, for the arrangement of the best shoots so as to display the growth to advantage deservedly engages the closest attention. We have already expressed an opinion upon the staking of plants, and still hold that the potful of sticks considered necessary to dress some plants for exhibition is nothing more or less than torture and a destruction of the beauties of that plant as designed by Nature. Having said this much in condemnation of a system still followed, we do not object to all forms of plant training, because it is necessary that assistance should often be rendered to make the most of their beauty, and to arrange them so that they may produce an harmonious whole without being denuded entirely of natural grace. To train a plant easily, it should be operated upon when young, or it becomes difficult to control. The most appropriate form to be adopted varies with character and habit, and is so dependent upon individual tastes that general rules are scarcely applicable. In all cases where plants are intended for exhibition, the training act should be accomplished some days before they will be staged to permit the foliage to assume its natural position, otherwise it will have a stiff and ruffled appearance.

THE CAMELLIA.

One of the most beautiful flowering plants for the conservatory is the camellia, yet it is rarely one sees nice specimens, as they are so often spoilt by errors in cultivation. It should be borne in mind that the camellia is almost hardy—indeed, in some parts of our southern counties they grow luxuriantly on lawns and in shrubberies, pass the winter safely, and flower attractively. Under these circumstances they do not produce blooms as early as when grown under the protection of glass, but those who have never seen the camellia thriving in such happy surroundings have no conception of their beauty. The foliage is of a rich glaucous green colour, much more glossy than is seen in those sheltered under glass, and this is induced by a healthy atmosphere and plenty of root room. The plant, as we know it in suburban conservatories, becomes with age a bare, leggy tree, with small and curled-up mottled leaves, due often to cramped roots when in a pot or tub, and if planted out it frequently suffers from drought at the root, because the gardener is afraid of wetting the ornamental tiles or some other fancy work used in decoration to a structure which is more often than not built for show rather than as a home for plants. What with the paved root bed below, coloured glass in front, and draughty perforations in the woodwork, no wonder the buds drop off. The surprise is that they live at all in such surroundings, much more produce flowers.

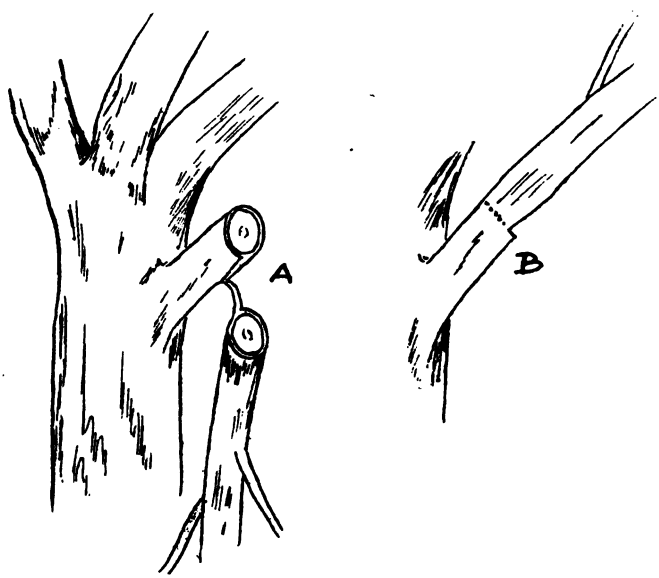
For spring blooming they only need suitable structures from which frost is excluded, well-drained sites, and good soil to ensure success, due regard being paid to the necessary cultural details of watering, ventilating, syringing, and disbudding as required, and to cleanliness of the foliage always. The border for the roots need not be more than three feet in depth. A compost formed of half or two-thirds loam, and the remainder turfy peat and leaf soil, with a plentiful supply of broken charcoal and silver sand, is suitable both for plants in pots and in borders. Camellias are so easily grown in pots that no amateur possessing a greenhouse need hesitate to attempt their culture. It is not necessary to

describe the mode of propagation, which involves the slow process of striking cuttings, and the somewhat delicate one of grafting them afterwards. No one can handle this preparatory stage of the plants so well as the nurseryman, and it is more economical and satisfactory to procure plants than to attempt raising them. Early autumn is a good time for purchasing, as at that time the buds are firmly set, yet not so advanced as to be shaken off or injured in transit. The plants should not only flower in the pots in which they are received, but they should make their growth and set the next crop of buds before being disturbed. If the pots are crowded with roots, as they should be, they will require copious supplies of water, especially in the spring when making fresh growth, and at that time also they must be syringed freely. After the buds are fairly set, the soil must never be dry, nor yet soured with too much water. Surface dribblings are fatal to camellias, for if the soil is moist at the top and dry at the bottom of the pot the buds will surely drop off. This must be the practice winter and summer, only during the former season some plants will not, perhaps, need watering more than twice a week, while in the latter they may need it every day.

The best time for repotting is immediately the buds are set, and before they attain the size of beads; if done sooner an undue check is given to the growth, if later there is danger of some of the buds dropping. A new pot should only be one size larger than the one in use, just large enough for the new soil to be conveniently pressed firm round the root-ball, and no more. The plants must be stood in a shaded place, or in a glasshouse facing north, after potting, syringed frequently, and watered carefully until the root-action is free, and then more copiously. They will endure some heat, with moisture, when making their growth, and if early flowers are wanted, that is the time forcing must be done, to induce early buds, for the plants cannot be forced after the buds are set. Old plants may be pruned to any extent desired after flowering, even to cutting them down entirely below the leaves, and if placed in brisk, moist heat and syringed daily, they will push fresh growth freely from the old stems; this is the way that old plants are made young again, and tall plants bushy. The leaves must be sponged frequently, and if scale attacks the stems, or mealy-bug the axils of the leaves, it must be carefully

washed off. If the plants set large clusters of buds, a portion should be removed when they are as large as peas, and others when they are seen to be swelling, until only one or two are left on each shoot to expand; by this method fine flowers will be ensured. If any plants need a stimulant, make the surface black with soot and water it in; there is no safer or better manure.

Amongst varieties, the best for an amateur's conservatory is Alba plena fimbriata (white), Lady Hume (blush white), Imbricata (red). These are double flowers, of perfect formation. Then there are striped, blotched, marbled, and other types, all fully described in the nurserymen's books. For growing out of doors the single-flowered succeeds best, and when well-furnished with lustrous leaves down to the ground makes a pretty object, either in or out of bloom.



How to saw a Branch off.

A.—An amateur usually snags off a piece of bark with it. Whereas if he had cut a little piece as shown at B this would not happen.

THE PANSY AND VIOLA.

Although a great distinction is made by horticulturists betweeen the pansy and the violet, they belong to the same genus, and the two are now represented in one plant known as the viola, which seems to be a happy combination of the best features of each. The pansy belongs to our earliest associations in garden flowers. In its original form it was known as heartsease, and used to be very abundant in hedgerows. Sometimes this wild type is found rearing its modest little head of blue and yellow amidst the gaudy things in garden borders. It is to the ingenuity of a lady that the first step was undertaken towards improving the size and colouring of the pansy as we now know it. Very early in the last century Lady Mary Bennett, daughter of the Earl of Tankerville, with the assistance of an intelligent gardener, cultivated a large bed of as many varieties as could be found growing wild on her estate near Walton-on-Thames, and it is from the seed sown in this experiment that the pansy became, through the agency of specialists, to be recognised as a florist's flower.

The pansy is divided into many classes by experts. The most important are the show varieties, represented by white, cream, and yellow ground flowers, with rich beltings, and white, yellow, primrose, and dark blooms of one colour only; fancy varieties of Continental origin with large and variously-coloured flowers of striking form and character; and the bedding varieties, with dwarf, compact, wiry growths and continuous free-blooming properties. The show varieties are singularly handsome, but require special care, being of somewhat curious constitution, which deteriorates in some soils. Under ordinary culture they seem to succeed best in the North of England and in Scotland, where the climate is moister and cooler than in the South.

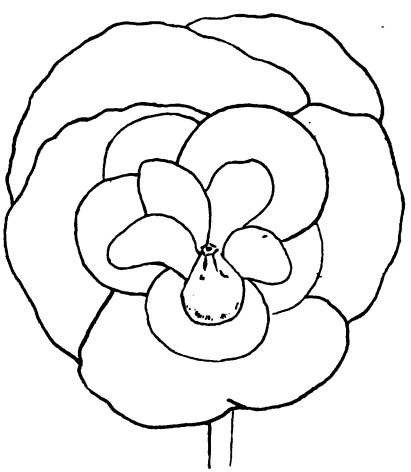
The amateur who has purchased some of the small plants exhibited in shops in London each spring, with one enormous bloom on them, is often disappointed at the results. He plants these in

the hope that he will get others as large, but it rarely happens that he is successful. These plants are reared from cuttings, grown in very rich soil, and after the removal of many surplus blooms they are brought to a state of perfection at a certain time when they will sell to the best advantage. All improved types of plants that have been obtained by artificial means have a tendency to return to that wild state from which they have been reclaimed, and this tendency is particularly great among the most highly cultivated pansies. Another fact not generally known is this: In a seed bed it will be noticed some of the seedlings are more robust than others, and in an ordinary way these are the first to attract attention when the plants are pricked out or potted off. These strong seedlings in a highly-bred strain generally give the commonest flowers. Named varieties that have been propagated by cuttings obtained in the early spring are best kept in moderately-sized pots, using a light, rich, open soil, and set out in the open ground in early summer, though the boldest flowers are had from plants grown in pots from cuttings struck in September, potted in October, and wintered in a cold frame. When planted out in spring for summer blooming the soil should be kept moist, and the plants occasionally top-dressed with a rich compost; the young growths thrown up from the hearts of the plants root into this, and make nice stuff when divided in autumn.

The fancy pansies are of vigorous and taller growth, and not so well fitted for cultivation in pots as the show varieties, though with care we have seen excellent specimens. It is best to dig deeply a piece of ground for a bed of pansies, manuring it well, and before planting put on a layer 2 in. deep of an open gritty soil, and the plants 12 in. apart, pegging down the strong shoots as they make growth. One of the principal objects to be attained in the growth of pansies is to prevent a check in their progress, either by cold winds, sharp frosts, long droughts, or watering them in hot weather with cold pump water.

Bedding pansies represent a race calculated to withstand the heat better. They do well in mixed borders, and are alike useful for spring and summer gardening. They became famous some years ago through being extensively employed at Cliveden, at that

time the Duke of Westminster's charming place on the banks of the Thames. Amateur cultivators mostly raise their plants from seed. Good seed is scarce, but the best strains of the large seed houses are reliable and satisfactory. It is best to sow in boxes of light sandy soil, placing them in a cold frame or shady place. The seed should be just covered, and the surface kept moist. If sown now, the young plants will bloom during summer, and when sown in August they flower the following spring and summer. If more convenient, the seed may be sown thinly in beds in a cool, partially shaded spot. There are black, white, and blue pansies, as well as peacock and magpies. As with every other flower, the going to seed exhausts the energies of the pansy, so that all decaying flowers should be removed before the seed-pods commence to swell, and the season of beauty will be prolonged.



THE POLYANTHUS.

In the whole range of florist's flowers none are of more easy cultivation than the polyanthus, which is one of the first of the hardy primrose family to greet us in the spring. It doubtless had its origin from the cowslip of the fields, and has become the beautiful thing we now find it after centuries of labour on the part of the expert gardener. Not only have his efforts imparted a new as well as a distinct arrangement of colours, but the individual flowers have increased from the size of a threepenny bit to a two-shilling piece. It is one of those plants of the hardy border or rock garden impatient of pot culture, for wherever grown in a cramped-up state, where its long, fleshy roots are unable to extend, it seems to lose half its luxuriance and beauty. The present popularity of the polyanthus is largely attributed to the magnificent beds that have been on view during the last few springs in Regent's Park and Hampton Court gardens, where its charms have been noted by thousands of visitors. There are two types, called "goldlaced" and "fancy"; the former is famed for its beauty, but allows of little variety; the latter embraces all shades of colour from pure white to the richest maroon. All are hardy, of vigorous growth, and stand unharmed through the severest winter.

The polyanthus should always be grown in a cool place, preferably with an eastern aspect, or otherwise wholly shaded from the midday summer sun. The only sure guidance in the cultivation of a plant which is the offspring of a wildling is the observance of its natural condition and habitat. When seed is sown in spring the plants become very strong by autumn, and bloom with great freedom the following spring. It may be scattered in a bed made up of good turfy soil, mixed with some decayed leaves, made fairly firm and kept moistened in dry weather. There they will thrive until wanted for transplanting in the autumn. Old plants are divided about the end of July when at their summer rest. They may be neatly detached with the fingers, but should not be torn apart; plant them deeply, quite covering the crown, for it is from this that many of the new rootlets will emerge. Give a good watering or two, and they will afterwards take care of themselves.

BEDDING PLANTS.

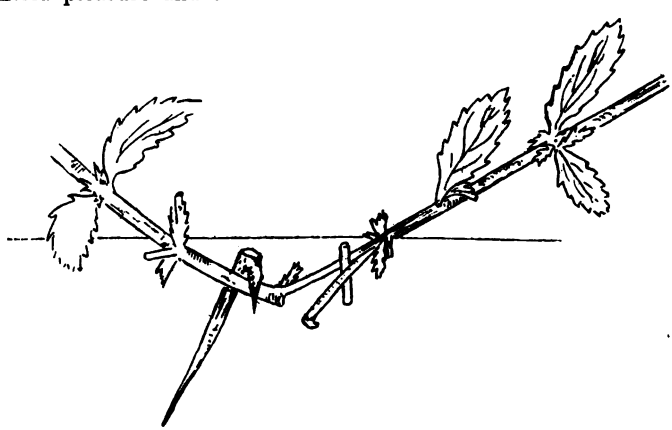
Everyone is eager about May to get out his plants for summer decoration. Before bedding out our advice is to see that there is a workable soil of reasonable depth. In the matter of quality it can be easily improved by the addition of some composition such as is used for potting. Flowers are mostly greedy feeders. This brings us to the question of manures, which should have been applied in the autumn, so that the winter rains and frosts may have played their fullest forces upon the soil, and brought it to productive condition. If strong manure is applied now, it is likely to develop a crop of leaves rather than flowers; this is the reason why the application of rich soil instead of crude manure is recommended as an accompaniment when the plants are set into their summer quarters, and it is this enrichment that is the foundation of summer beauty. If the surface is inclined to be at all solid, fork it over a few times, so that both the rain and sun can penetrate, and by their united action actually warm the soil and so promote the welfare of the new occupants.

The next point is to prepare the plants for the beds, which some will say is an easy operation; this is granted, but it is because it is so simple that few take any trouble over it. The plants have been, we will say, brought from a frame, or from under the protecting influences of a south wall, and are now to be placed in beds, exposed to all the various changes of wind and weather. Perhaps it has never occurred to the owner to water them, and if they are stowed into a small trowelled hole when dry, the earth replaced, and a dribble of water applied, which makes the surface like so much cement, it can truly be said in plain language that their funeral has been very carefully carried out.

All bedding plants should be thoroughly soaked the evening before the day they are to be transferred to the open ground. This copious watering, besides stimulating the roots, also facilitates the removal of the plant from the pot or box. Now as to the method of removal from the pot. Take hold of it with the right hand, placing the plant through the fingers of the left hand, turn it upside down, and against the edge of a block of wood, a wooden stool, or anything handy made of wood, tap the rim of the pot lightly, and thus release the plant; then let it remain for

the moment upside down, held firmly in the left hand. With the fingers of the right hand pick off any crocks or other rough material forming the drainage, and then carefully disentangle some of the outside roots which have been cramped into circles through being confined. The operation requires a little patience, but its advantages are great, as these loosened rootlets attach themselves quickly to the new soil in their fresh abode.

In making the hole for its reception the operator should not err on the side of smallness, but make it deep enough to hide the whole of the pot soil when pressed in, and the fresh earth is then levelled back with the fingers. If properly planted and watered the plant will start at once, instead of standing still for many weeks, and in some cases remaining the same size until the summer is well advanced. When a bed is covered with beauty it matters little how the plants are distributed, as the wealth of both flower and foliage compensates for the mixture, but it is as well if some arrangement can be followed. Plants want air, room, and light. Space is often more difficult to command than air, and the evil of overcrowding is great. To pack in a dozen plants where three or four would suffice is fatal, but when given breathing room, together with a fair start, a healthy specimen will speedily fill and adorn the intermediate spaces. A little thought, time, and patience in these matters will result in a reward of untold pleasure and satisfaction.



Pegging down a Verbena plant.

MIGNONETTE IN POTS.

It is surprising how easily some plants, which are usually only seen in our gardens during summer, can be made serviceable at other seasons. Take, as an instance, the modest, but popular, mignonette. Here we have a plant just as amenable to the dictates of the gardener in pots as it is in the open ground; indeed, more so, because it can be trained to assume all manner of forms, and, if properly treated, it will live for years.

The most useful sized pots in which to grow this plant are 4 in., 5 in., and 6 in., these measurements representing the width across the top. In the first place the pots must be clean and dry, with about one inch of finely broken crocks placed at the bottom as drainage. On top of this place some rough soil, and then fill up to the rim with a mixture of good fibrous loam, a little leaf-mould, a pinch of soot and lime, and rather more sand. It should be pressed down firmly into the pots, and the seed sown thinly, and lightly covered with fine-sifted soil. After watering set the pots in a shaded frame until the seedlings appear, when abundance of air and light must be admitted. Thin out to four plants, and after they get strong place on shelves near the glass, and in plenty of air, as mignonette does not do well in a confined atmosphere. Seed sown at once will come into bloom by the end of summer, and another lot may be sown in August and September to come into flower during winter and spring.

To obtain plants in bloom during January and February, the most successful cultivators sow in the open ground very thinly about the end of July. By the middle of September these plants will be ready for potting. They choose pots of various sizes—those called thirty-twos (6 in.) seem to be most liked—and into these they put from eight to twelve seedlings, thinning them out afterwards to about four. The soil of which they make use is rather light

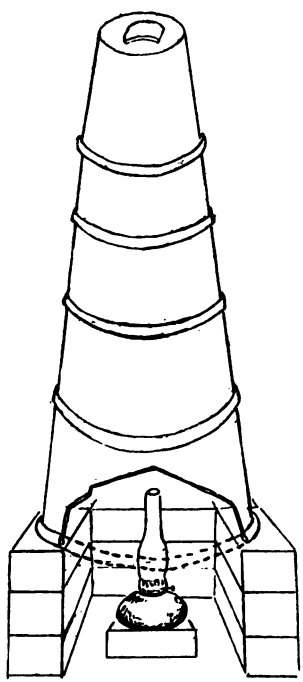
and porous, permitting the water to pass freely through it. After potting, the plants are placed in a cold pit or frame, and shaded for a few days until they have got over the change; then they are exposed to the weather, without any protection, except from dashing rains, until November. By the first of that month they should be showing flowers, and may be removed into the greenhouse, conservatory, or drawing-room, where they will continue to give a display during the winter.

Care will be necessary in regard to watering, so as not to let the soil become too wet, for if the drainage is defective the plants will turn yellow and die off. As regards stimulants, a little guano (dissolved in water) and soot will have an excellent effect, imparting a dark-green hue to the foliage, and making the spikes of bloom large and lasting. This method produces the ordinary type of upright plant.

There is also the "bush" culture of mignonette. For this method a few seeds should be sown in a small pot in spring, thinning the seedlings out to three, or, perhaps, four. When they are rooted well, change them into a 4 in., and onwards till the final move into a 6 in. As the plants mature, the tops should be pinched out at intervals to make them grow bushy. The mignonette is also grown on a stem, with a head like an umbrella. For this special culture three or four seeds should be sown in a very small pot at once, and the seedlings thinned out to two, and changed as soon as required into a 4 in. pot. When the plants have grown strong the weakest should be taken out, and a stake put to the survivor. Pinch out any appearance of flowers, and when the plant shows further growth the strongest shoot only should be retained.

When this growth should be stopped depends a good deal upon the height of the head, which is usually about 2 ft. from the pot. The "umbrellas" are easily made. A good stout wire is first worked into a circle of, say, 18 in. diameter; this should be made fast to the stake at the top, standing in the centre; then other wires can be run round at different distances until the desired shape is formed. The plants should be repotted as required into

larger sizes for flowering in. All that is needed beyond this period is to keep pinching the flowers out as they appear, and let all shoots grow, and carefully tie them down on to the "umbrella," with a view to covering it. When it is well covered the flowers may be allowed to develop. The plants should be grown from the commencement as cool as possible, and kept near the fullest light. The mignonette has been greatly improved by florists from the original wild type found growing in chalky districts of the country, and some really beautiful varieties are now available. There are many pretty plants amenable to this style of culture, notably geraniums, violets, heliotrope, and fuchsias, all of which look imposing as standards.



A simple greenhouse heater made of flower pots, bricks, and an ordinary lamp.

CLIMBING PLANTS.

After exhaustive inquiry into the characteristics of climbing plants, the late Professor Darwin came to consider them the most highly-organised members of the vegetable kingdom, and was inclined to claim for them some higher attribute than what is generally understood as "vegetable instinct." The methods such plants adopt in their procedure to suit variations of conditions are certainly remarkable when looked closely into. It may have been noticed by some of our gardening friends how the common ivy, when reaching a point that hinders its climbing powers, immediately forms a bushy head, and commences to throw out a profusion of blooms, which produce berries to be ultimately carried away by birds, in the hope that they may be dropped into some situation more congenial for climbing than that in which the parent plant finds itself; and the flat-footed tendrils of the Virginian creeper, how tightly they clasp the bricks and mortar on the outside of a house, requiring no artificial support whatever, whereas on an open wire fence these feet are entirely missing.

The adornment of the roof, sides, and pillars in conservatories and greenhouses by means of flowering and ornamental foliage plants affords considerable scope for the display of taste and judgment in the selection and arrangement of species most suitable for the character of the structure. It is a fashionable habit to decorate the lower parts of the building and the staging, but hanging drapery, in the form of festooned climbers dropping from the roof or from supports is only seen in the best establishments. The feature deserves the consideration of all amateurs whose limited surroundings make it a matter of paramount importance to utilise every available space capable of producing graceful foliage or elegant blossoms.

A conservatory wall filled with a collection of climbing plants selected from the list we enumerate below has the prettiest effect at all seasons, for if one is resting others will be putting forth their full beauty, but there must be method in their training,

for if the plants are allowed to run up without filling the bottom at starting there will be no getting them right afterwards without actually cutting them down again, and nothing looks worse than to see staring blank spaces or long and naked stick-like stems. Soft-wooded greenhouse climbers are apt to grow very rapidly, and are also at times likely to get infested with vermin, which in olden days was very difficult to get rid of, as the close proximity to the dwelling-rooms prevented the use of the old-fashioned tobacco-smoking; improved methods, however, are now available for the purpose, so that this difficulty is to an extent removed.

	COLOURS.	FOLIAGE	IN BLOOM.	SOIL.
Abutilon	Various	Evergreen	Mar.-Nov.	Mixed
Akebia	Purple	Evergreen	Mar.-June	Mixed
Bougainvillea	Purple	Deciduous	May-Nov.	Mixed
Brachysema latifolium	Violet red	Evergreen	Spring	Mixed
Bignonia	Various	Deciduous	April-Nov.	Mixed
Bomarea	Yellow and red	Herbaceous	May to Oct.	Mixed
Cobœa	Purple and white	Evergreen	July-Sept.	Mixed
Eccremocarpus	Red and yellow	Evergreen	July-Oct.	Mixed
Ficus repens	—	Evergreen	—	Mixed
Fuchsia fulgens	Red and green	Deciduous	Summer.	Mixed
Hardenbergia	Red and blue	Evergreen	Mar.-May	Mixed
Habrothamnus	Red	Evergreen	Feb.-Nov.	Mixed
Hibbertia volubilis	Yellow	Evergreen	Mar.-Aug.	Mixed
Hoya carnosa	Various	Evergreen	Apl.-Oct.	Mixed
Ipomœa	Various	Annual	Summer	Mixed
Jessamine	White, yellow	Evergreen	Summer	Mixed
Luculia	Rose and white	Evergreen	May-Nov.	Mixed
Lapageria	Rose and white	Evergreen	Various	Mixed
Mitraria	Orange	Evergreen	May-Aug.	Peat
Manettia	Various	Evergreen	Apl.-Nov.	Mixed
Mandevillea	White	Deciduous	June-Sept.	Mixed
Physianthus	White, red	Evergreen	July	Mixed
Plumbago	White and blue	Evergreen	Apl.-Dec.	Peat
Pergularia	Yellow	Evergreen	Summer	Mixed
Passiflora	Various	Evergreen	May-Nov.	Mixed
Rhodochiton	Purple and red	Evergreen	July-Sept.	Loam
Rhyncho-spermum	White	Evergreen	July-Sept.	Peat

	COLOURS.	FOLIAGE.	IN BLOOM.	SOIL.
Ruscus androgynus	White	Evergreen	Spring	Mixed
Solanum jasminioides	Milk white	Deciduous	July-Sept.	Mixed
Sollya	Blue	Evergreen	May-Sept.	Mixed
Stephanotis	White	Evergreen	Mar.-Nov.	Mixed
Swainsonia	Various	Evergreen	May-Sept.	Mixed
Tacsonia	Various	Evergreen	July-Sept.	Mixed
Tecoma	Various	Evergreen	July-Sept.	Mixed
Thunbergia alata	Yellow	Annual	Summer	Mixed
Thibaudia acuminata	Crimson	Evergreen	Summer	Mixed

Where it is stated in the list that the colours are various this indicates that there are several varieties; the months given as flowering periods must only be taken approximately, as a great deal depends upon aspect and temperature. By a mixed soil it is understood that loam, peat, and sand can be employed.

There are many beautiful flowering plants that do not come within the class of climbers, but which, with a little care, may be trained to cover walls, arches, or trellis in conservatories, and in such positions become objects of great beauty. Amongst them may be named the heliotrope, ivy-leaved and other geraniums, fuchsias, brugmansia suaveolens, a really beautiful object, of tree-like habit, bearing large trumpet-shaped flowers a foot long, some white, others pale pink, and delightfully fragrant, some of the tropæolums of the lobbianum section—with their beautiful scarlet flowers, which are very showy even in the depth of winter, and will all train along rafters without trouble—while asparagus plumosus and smilax are serviceable for their foliage. For covering walls, oranges, lemons, citrons, and camellias are excellent when tied to trellis, with their rich glaucous evergreen foliage.

Climbers under glass provide a natural shade during the summer months to many more delicate plants in the beds or borders below, besides giving a thoroughly tropical effect much preferable to some artificial protection in limewash or canvas. They succeed better when planted out than when confined in pots, and some method is

required in their training. It is not well to interfere too constantly with the growing shoots, nor to restrain them too much. Such as are inclined to become an entangled or inseparable mass must be looked to, but otherwise let them enjoy liberty.

The beauty of climbing and creeping plants is often marred by the arrangement used in the display. Much of the fancy wire-work employed is a barbarous way of training the delicate shoots of many of the most beautiful among them. Wood trellis should always be used in preference to wire. Climbing plants, in all their rich and various beauty, are always a source of the utmost enjoyment, whether viewed as twisting round the porch or hanging in graceful festoons from some terraced balustrade. In towns the charm of the climbing plants often meets with but sparse recognition, but where they are judiciously resorted to they constitute an important element of cheerfulness to the barest surroundings. Much money is spent sometimes upon artistic embelishments, when structures for climbers might be made suitable for many characters of scenery, for nothing can be prettier than the effects of festoons, arches, temples, colonnades, verandahs, arbours, and columns when loaded with beautiful flowering and foliage plants.

Hardy climbing plants, or those that are amenable to the dictates of the gardener for covering outside walls, pergolas, alcoves, or verdant passages, are attractive in any position where they can ramble. Rock work, tree stumps, and grottoes should always be covered with living growth, and drooping plants are appropriate objects in vases and hanging baskets; indeed, these decorations appear in a much more artistic and appropriate character when overhung with the natural flowers and foliage of creepers than when hanging from bare wire or naked wood-work, filled with a few stiff and formal summer plants.

In the hardy section, take the honeysuckle, jessamine, the small-leaved ampelopis, and its large-leaved companion the Virginian creeper, green and variegated ivies, the sky-blue and white wistaria, the rampant hop, the noble magnolia, the elegant clematis, the pyrus, crataegus, escallonia, cotoneaster, forsythia, wild vine, and the myriads of beautiful climbing roses. These are but a few of the very handsome things available for covering every space capable of supporting growth.

CLEMATIS.

The wonderful improvements that have been effected in the clematis in recent years by skilled hybridisers have brought it from a position of comparative obscurity to the very front rank in the floral world, although it is not of much service for the roof of conservatories, as the flower when expanded insists upon facing the sun. Consequently, only the backs of the petals are seen from below, and much of their beauty is lost. Happily, several varieties flourish so luxuriantly in the open air, particularly in the southern parts of the country, that they take a prominent place in decorative gardening. It is not for walls, fences, and trellis work alone that they are adapted as embellishments; they are likewise splendid objects for pillars and rockeries, as they creep as well as they climb. Those of the patens or Florida types are often more appreciated in under-glass positions, trained in pots, than when grown out of doors, coming into bloom, as they do, before spring is over, and at a time when showy flowers are somewhat scarce. Some of the smaller-flowered species, such as C. montana, C. vitalba, or C. viticella, are also quite in keeping with wild scenery, when scrambling over ruins, hedges, and bushes, whilst several of the herbaceous and sub-shrubby species and varieties are worthy of a place in any mixed border. Although most species lose their leaves in autumn, it requires an extra severe frost to touch the naked stems, from which the new season's growth bursts forth with increased energy each succeeding spring. In some situations, where a low growth is desirable, it is best to cut the stems down to the ground at the end of summer, top-dress the surroundings of the root, and an extra strong growth will appear next spring furnished with foliage its whole length. The clematis will thrive in any good garden soil, but it prefers it rich, when the growth will return many compensating advantages.

The clematis, in its varied classes, produces a long succession of large handsome flowers varying considerably in colours, but in every case extremely beautiful, and it is also amenable to all kinds of training. It makes a glorious sheet of blossom over an archway or porch, on a pergola, or fringing the overhanging brow

of a balcony. They are hardy enough, except in the bleakest climates, but a warm sheltered position and full exposure of sunshine are conditions that conduce greatly to their prosperity. When employed to cover walls or trellises they should be carried up a certain height, then permitted to fall over naturally, a posture in which they look far prettier than when tied up close. Here is a serviceable list of the several species calculated to furnish flowers from May to October. Only one, namely, C. vitalba, is a native of England, seen growing freely in dry localities, rambling over hedges, bushes, and hanging cliffs, and covered each autumn with plumose tufts, which has gained it the name of Old Man's Beard. C. montana flowers in May, and is followed throughout the summer and autumn by the hybrids of the patens, Florida, lanuginosa, viticella, and Jackmani types. To these must be now added the new coccinea hybrids, which are really beautiful, often remaining in bloom until the frost comes.

Of the Jackmani class these are a few of the best: Jackmani alba, white; Jackmani superba, deep violet purple; Magnifica, bright purple red; Madame E. Andre, bright red; Prince of Wales, deep purple; Tunbridgensis, mauve; Star of India, violet-purple, with red bars. The lanuginosa types, which do not need cutting back to the same extent, a moderate trimming of shoots being all that is wanted, provide many lovely varieties, including: Beauty of Worcester, violet blue; Impératrice Eugénie, pure white; Lady C. Neville, French white, mauve bars; Grand Duchess, blush white; Fairy Queen, pink; Rubella, maroon; Princess of Wales, bluish mauve, satin petals; Lawsoniana, rosy purple, with deeper veins.

Other groups include the Florida, viticella and patens. From the latter group one may select a choice and interesting variety, including: Albert Victor, deep lavender; Sir Garnet Wolseley, pale blue, purple bars; Miss Bateman, white, deep red anthers; The Queen, lavender, large and fine; Fair Rosamond, milk white; Lady Londesborough, silver grey. Many of the Florida group produce double flowers: Countess of Lovelace (double), lilac blue; Duchess of Edinburgh (double), white; Earl of Beaconsfield, rich purple; Enchantress (double), rose white. Among the viticella group may be named, Ascotiensis, azure blue; Kermesina, rich red; Lady Bovill, steel blue.

THE HYACINTH.

The hyacinth grows well in water filled into glasses and now obtainable in all kinds of shapes and fanciful devices. Those with broad flat bottoms are recommended, as they are not likely to tumble over just when the flower spike is at its best. The receptacles should be filled with clear rain water, placing the bulb so that the crown of the root just comes in contact with it without being immersed .Some growers start the roots into action by placing the bulbs on moistened sand, or in damp moss for a week or two, and when they have commenced to shoot out, they are carefully put into the glass containing the water. It is not at all a bad plan for a novice to adopt. Put in each glass two lumps of charcoal about the size of a walnut—they tend to keep the water sweet, and many possess some little manurial value. Make the charcoal by burning a piece of dry wood, that bought in shops is often chemically treated. Next put the bulbs away in a dry cupboard for six weeks or so; meanwhile they should root deeply down into the water. The best hyacinths are produced from fairly large-sized bulbs, they are more likely to throw one good spike, not two or more indifferent ones. It is advisable to look at the bulbs once a week to see that they are going on well. If the water in any glass becomes offensive to the smell, or the points of the roots get covered with a slimy substance, turn it out, cleanse the glass thoroughly in tepid water, and the roots of the hyacinth also very carefully, and put the bulb back into the glass again. This very seldom happens when pure charcoal is placed in the glasses. When the bulbs have nicely rooted, and they show signs of starting into an upward growth, they must be brought gradually to the light, and ultimately placed where they will get it all, and not become drawn up. The aim of the cultivator should be to encourage a stout, sturdy growth, when good blooms can scarcely fail to result.

The principal difficulty experienced by those who grow hyacinths in water in sitting-rooms is to prevent their growing long, weak, and pale, so as to flower badly, and be in constant danger of upsetting. This is remedied by keeping them close to a window, where they can be constantly exposed to a bright light all day,

but not in baking sunshine or a draughty air. It may also be added that they should always be kept in the dark for a few weeks after they are first placed in the water-glasses, and the total absence of light will prevent the leaves from being stimulated into growth before the roots are well developed. When the flower-stalk begins to ascend wire supports can be placed in position, and the hook which grasps the stem of the spike be gradually raised as required. These wire supports are obtained at the seed shops. When the glasses are in the sitting-room, where there is a fire, some of the water will escape by evaporation, and care must be taken to keep the glasses filled as needful. Some grow hyacinths in glasses in a mixture of cocoa-fibre and fine charcoal; as a matter of course such a compost has to be kept moist, but not sodden.

This very interesting mode of growing hyacinths is a delightful phase of house gardening, and may be attended with good results if sufficient care is taken. It is very necessary that the firmest, best-shaped, and clean-skinned bulbs are employed, and even then they must be selected with some knowledge, as some sorts succeed much better than others. Those varieties with single blossoms are also preferable, because they generally possess a more robust constitution than the double ones. Here is a useful selection of a dozen, and whilst they are recommended for culture in water, it does not imply that they are not adapted for growing in pots: Lady Derby, rich rose; Alba Maxima, pure white; King of the Blues, Oxford blue; Lothair, sky blue; Gertrude, bright pink; Robert Steiger, crimson; La Franchise, waxy white; Grand Lilas, Cambridge blue; Lord Percy, clear rose; Grand Maitre, rich blue; Von Schiller, deep red; Snowball, white.

Few winter and spring flowers are more worthy than the hyacinth, whether we regard its enormous spike of blossoms in varied shades of colour, or the sweetness of its perfume. The easy manner in which it can be successfully grown in pots and glasses in the house, or in beds, patches, edgings, and ribbons in the open air justly merits it a place in the garden, conservatory, or drawing-room of every lover of beautiful flowers. Just as fine spikes of bloom can be produced when grown in water and moss, as when planted in the richest compost, and successional plantings ensure so many connecting links between the darkest days of winter and the return of lovely spring.

In order to secure the best bulbs, procure them during September and October. The pots should be the 48-size (about 5 in. across the top). Put over the hole in the bottom a flat crock, with a handful of smaller pieces above it. A suitable soil to pot them in consists of one-half clean loam, one-fourth leaf-mould, one-eighth powdered cow-dung, and one-eighth silver-sand. This should be sifted, and the rough which is left in the sieve can be used to fill 2 in. between the crocks and the fine soil, which add lightly to within a couple of inches of the top. On this place the bulb in the centre; give it a gentle press sufficient to more than half bury it, add more soil, and press it round the bulb, so that when the work is completed just the point and neck shows above, and about level with the top of the pot. If the soil is dry it is safest to give one watering, and the best way to apply it is to stand the pot in a saucer of water, which it will suck up in a short time.

When all are potted, the bulbs should be taken to some shed or by-place protected from heavy rains; the whole to be covered over, 6 in. above the pots, with fibre or ashes. Some growers put a small inverted flower-pot over the bulb to keep it clean and free from the covering material. Here they must remain for several weeks, or until they are fit to be transferred to the greenhouse shelf to bloom, and then they must be gradually supplied with an abundance of water. When first uncovered they should not be exposed in this blanched state to a strong light, but by degrees, when the unfolding leaves will soon attain their natural colour. By this process the pots are full of roots before they are subjected to heat, and a strong flower-stem is soon thrown up. According to the time of potting and placing in heat a succession of bloom may be obtained from Christmas to past Easter. The beauty of a hyacinth consists in having a large, symmetrical, and close truss of blossoms, with short, stiff, and healthy foliage. Twelve hyacinths for pot culture: Laurens Koster (purple), King of the Blues (Oxford blue), Norma (rich rose), Masterpiece (blue black), Charles Dickens (sky blue), Lord Macaulay (rose carmine), Mont Blanc (pure white), Roi des Belges (vivid scarlet), Czar Peter (lilac), Elfrida (cream), Grand Lilas (Cambridge blue), Ida (pure yellow).

THE TULIP.

Tulips are the most gorgeous of spring garden flowers and so easy of culture. In general, their season covers three stages, the first for forcing to produce flowers by Christmas, the next the early flowering sorts for beds and borders, and the last section includes the old English or late flowering species. For forcing purposes, the Duc Van Thols are neat, with dwarf habit of growth, and brilliant colour. They will grow and bloom freely in pots, sand, or moss. A beautiful effect is produced by planting six, twelve, or more bulbs of the different or same shades of colour in fancy pots. If arranged in October or November they are ready, according to the heat in which they are grown, early in January and February, and in the open garden they bloom in April or May, in company with the daffodils; and symmetrical flower beds or groups composed of the different colours, produce a striking display. To this section should be added the Pottebakker, a more robust type with larger blooms in various tints. The next group comprises what are called early garden tulips. These commence to bloom in April and continue until the late varieties come in. They are remarkable for rich colours and beautiful markings. Though double tulips are not so popular they embrace a combination of the most varied colours.

As to planting see p. 85. It is the common practice to put them into the soil with a dibble, which is a mistake. It is best to use a trowel, if put in separately, or make a trench with a spade for a quantity, setting the bulb about six inches down in the bottom and about six inches apart with the point uppermost. The soil should be gently pressed on top, and when the bed is finished raked over to make it tidy. If a thin lining of not more than an inch of cocoanut fibre is laid on, it livens up the surface during winter, and also serves as a protection. Sufficient moisture is always found in the soil at the season of their growth.

The tulip is not usually left in the ground after flowering, like the crocus, but pulled up and thrown away, yet in a sandy loam soil they will come up year after year. As a pot plant the tulip is treated somewhat similarly to the hyacinth, only that three bulbs are put in one pot. Here is a useful selection of the popular bedding types:

SELECT EARLY SINGLE-FLOWERED TULIPS.

Eight Inches in Height.

Bruid van Haarlem, scarlet and white.
Cottage Maid, rosy pink and white.
Crimson King, bright crimson.
Royal Standard, scarlet and yellow.
Van der Neer, purple.
Yellow Prince, yellow.

Ten Inches in Height.

Comte de Mirabeau, white.
Couleur Ponceau, crimson and white.
Fabiola, white and purple.
Joost Van Vondel, rose-flaked white.
Proserpine, dark rose.
Vermilion Brilliant, bright scarlet.

Twelve Inches in Height.

Chrysolora, yellow.
Couleur Cardinal, crimson and scarlet.
Duchess de Parma, red and yellow.
Keizer Kroon, scarlet and yellow.
Molière, delicate lilac.
White Swan, white.

DOUBLE-FLOWERED TULIPS.

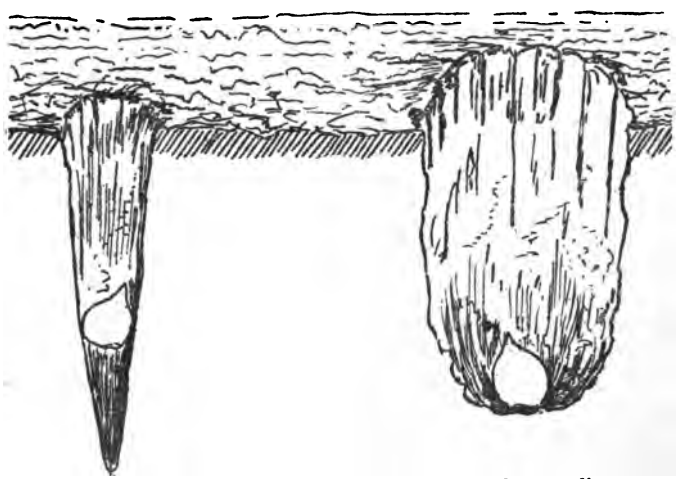
Eight Inches in Height.

La Blason, rose and white.
Lac van Haarlem, violet.
La Candeur, white.
Murillo, blush white.
Princess Alexandra, crimson and yellow.
Rubra Maxima, deep red.

Ten Inches in Height.

Imperator Rubrorum, scarlet and crimson.
Rex Rubrorum, scarlet.
Rosine, rose and white.
Titian, crimson and yellow.
Tournesol, red and yellow.
Yellow Rose, yellow.

Keizer Kroon is not only the most brilliant in colour, but the most robust tulip grown, and a mass of its fiery scarlet and yellow cupped blossoms makes a grand display. Its best companions are Cottage Maid, Couleur Ponceau, Proserpine, Chrysolora, and White Swan. The late flowering tulips will be found in the merchants' catalogues. There are also several curious species of tulips useful for cut flowers that will thrive along a border and come up year after year without attention. They, too, will be found described in the catalogues.



How *not* to plant a tulip.

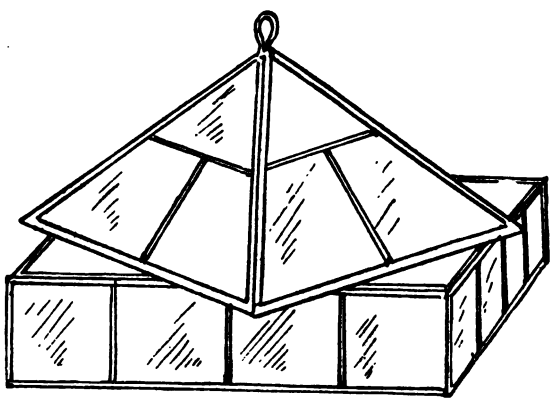
How to plant a tulip.

THE RANUNCULUS.

In the ranunculus and anemone we have two beautiful garden flowers, which have become comparatively neglected. Indeed it seems remarkable that such easily-grown plants, so readily obtainable in a handy form all the year round at such a low price, should not have gained the favour of all who have gardens. Half a century ago the ranunculus was one of the chosen things of the East-end amateurs, and exhibitions were frequently held almost entirely devoted to it, where the various peculiarities in colour and form of the petals were criticised in a manner which we may associate with the carnation and auricula of to-day.

The ranunculus bed should be made of light, rich earth, the top spit (spadeful) of a pasture, to which should be added one-third in proportion of cow-dung. This compost must be frequently turned over to break the clods, a sharp look-out being kept for wireworm (a yellow-brown grub about an inch long). To form the bed dig out the original soil at least 2ft. deep, and if the bottom is found to be wet put in 6in. of draining materials (broken bricks, lime rubbish, ashes, etc.), over which lay 3in. of well decomposed cow-dung; fill up with the prepared soil, pressed down, and plant the roots on it in rows 6in. apart and the same distance between the plants, and cover them over to the depth of about 6in. This planting should be done from now to March. As soon as the rows can be discerned in spring stir the surface of the soil between the plants, and should the winter be severe give a slight protection of dry fern or straw litter, or a covering of cocoanut-fibre, whichever is most convenient. The latter would also serve to retain the moisture and protect the roots from the scorching sun when in flower, and lengthen the period considerably. Early in March the flower-stems of autumn planted tubers will come up under the influence of sunshine, whilst those planted in winter and spring will not bloom until May or early in June. When the plants have done flowering and the leaves are withered take up the roots and dry them in a shady situation, when

they may be stored away till wanted for planting the following autumn, but they are so cheap that it is advisable to purchase fresh supplies each year. The ranunculus root is formed of so many spiky points radiating from a central crown. For the information of those who do not know, these points must go downwards when planted. They are often put in the other way by amateurs, who are surprised they do not get a satisfactory show of either foliage or blooms.



A Garden Hand Light.

DECORATIVE PLANTS.

Much has been done with the beautiful plants that cover the face of the earth in decorating landscapes, flower gardens, and greenhouses, and yet there is a kind of display that people do not seem thoroughly to understand—the decoration of dwelling-rooms. The endless forms in which plants appear, their adaptation to certain situations, and the amenity and beauty with which they invest the scene are all subjects of never-failing interest in this connection. Fortunately, the kingdom of Flora presents an endless diversity of subjects suitable for house decoration, many exceedingly beautiful, none of them void of interest, and, what to the majority of plant lovers is of first importance, numbers of them are cheap to buy and easy to raise. Unlike some other articles of furnishing, they do not readily wear out, and even if a few show a disposition to sicken from constant ill-treatment they can be reproduced by some system of propagation, just as its kind or habit may require.

The indoor culture of plants is also intimately connected with the sanitary condition of our dwellings, as gases which are detrimental to human life constitute the main nourishment of plants, which absorb their poisonous properties, and again restore them to the atmosphere. When placed in entrance-halls, lobbies, window conservatories, plant-cases, or corridors where a bad light and constant draughts prevail, the wonder is that they thrive at all, but just as inattention to these little matters will ruin a plant, so will an excess of attention interfere with its health. A great drawback to successful culture is keeping the plants in a too warm and dry atmosphere. Dust and draught again are two serious factors militating against the health of plants leaving their genial quarters under glass. When in rooms they should never suffer want of water—a mere dribbling is of no use whatever. When they have served their turn and are ready for taking back to the greenhouse, they should be well washed and syringed; this cleanses all dust that has accumulated, and gives the plant fresh

vigour to strengthen itself. A great evil arises from the practice of taking choice hot-house plants direct from the stove into the dwelling-house, whereas if a little forethought were exercised, and the plants stood in an intermediate house for a few days beforehand, they would not suffer so seriously. In many instances where attempts have been made to decorate apartments with plants, failure has been the result chiefly through employing species of too delicate and fragile constitutions. There are some who cannot appreciate beauty in plants unless in the shape of flowers, and who entirely ignore graceful outline displayed by those with ornamental leaves. This is much to be regretted, because a judicious combination of both cannot fail to be recognised by all with refined taste.

The ornamental leaves of the aspidistra, or parlour palm, are particularly attractive, both in the dark glossy green and variegated types, and as it needs little attention, and will last for years without increasing much in size or being repotted, it is well adapted for rooms or windows where decorative space is limited. The small cup-like flowers which peep out of the surface of the soil are very peculiar. It is a plant capable of withstanding more hardships and rough usage than any other. It is an ideal plant for a city climate in its worst phase. Aspidistras are propagated by dividing the roots, preferably in early spring, and to encourage the young plants to get established quickly is an advantage. It is a curious thing that when pot-bound, the green-leaved variety will often become variegated. To keep the leaves in their full beauty, they should be sponged carefully both sides, at least, once a week; indeed, this treatment is necessary for all large-leaved plants, while such as have hairy or fern-like leaves should be taken out and syringed now and then to clear them from dust and dirt.

Aralia Sieboldi is another of the most useful decorative plants that can be grown, whilst its companion, A. gracillima, bears leaflets almost thread-like in fineness. There are a few others that should be included in every collection. Seedlings make the most handsome plants, but the aralia can be propagated from sections of the stem or cuttings of young growths. It requires plenty of water, and is apt to lose its leaves if kept dry. There are gold and silver variegated varieties, but the green-leaved seems most

generally grown. The graceful fern-like foliage of "Grevillea robusta" makes it particularly effective for drawing-room or table display. Such a remark will read like nonsense to an Australian, as out there the Grevillea is a giant tree of the forest. Seedlings should begin to be useful plants at about six months old (see p. 93).

From the large family of Dracænas, all of which are durable ornaments with graceful foliage, we may select D. Australis, D. congesta, D. terminalis, and D. indivisa; these are types likely to do well in the house. Small plants are most useful for table or vase decoration, but large plants are more effective in entrance-halls, balconies, on pedestals, in porches and corridors. For this purpose nothing could be more suitable, and if kept well-watered and the leaves sponged regularly they will need little other attention. Sometimes the points of the leaves wither, and this is generally caused by improper watering—that is, giving a dribble, just enough to moisten the surface of the soil and deceive one as to the dry condition of the roots. It is better to water less frequently but thoroughly; the falling of the lower leaves is often due to the same cause, or standing in a draught. Dracænas are easy to propagate; one old plant will produce a number of young ones, either by dividing the roots when they come in knobby growths, or cutting the stem into pieces about 1½ in. long, and putting them, almost buried upright, into sandy soil, and the pots stood, if possible, in a hothouse or manure-bed. All possess most attractive foliage (see p. 93).

Ficus elastica, or the indiarubber plant, with its large, handsome leaves, is a fine thing for town houses, and will grow and keep healthy for years if in an airy place and well-watered, but it must not be stood in a draught, or the leaves will turn yellow and drop off. When a plant has, from various causes, become leggy or bare of leaves near the bottom, it is best to cut off the top and root it; it will soon throw out new shoots in a pot of sandy soil, with a little bottom heat. The indiarubber plant can also be grown from cuttings. The soil suitable is a mixture of fine loam and leaf-mould, topped with a sprinkle of silver-sand, and shading from strong sun is advisable at this stage. It is remarkable that if only a single leaf of this plant is placed stalk downwards in a bottle of water it will often throw out roots, and can be potted when sufficiently advanced. Being a native of tropical climates, it will not stand frost.

Palms are among the most important of decorative plants. It is rather a curious fact that while the palm family is of great extent, few of its members can be considered serviceable for decorative purposes outside of the regulation palm-house or conservatory; in most cases they are too fastidious in their requirements

Some Decorative Palms.

1. Kentia Belmoreana.
2. Areca lutescens.
3. Latania Borbonica.
4. Chamærops humilis.

to stand the altered conditions of life to which they may be subjected. The most beautiful of the palms are generally those requiring a moist atmosphere, a condition not usually found in a dwelling-house. The following are a few of the hardiest and most popular for the purpose we have in view: Corypha Australis, a

neat-looking species very suitable for room decoration; Latania borbonica, with fan-shaped leaves, which grow to a great size if planted in a tub or border; Cocos Weddelliana is a graceful palm, with arched and refined branches, which make it admirably adapted for table decoration; it will stand with impunity both drought and a dry atmosphere; being of a sun-loving disposition, it becomes limp and worthless if confined for any length of time in a badly-lighted room. This is one of the palms that will soon show ill-effects from over-watering. If the plants are put in vases they should be raised on a block or inverted pan, if possible, and not stand in water. When they are placed in a window, and air is given, the window should be fully opened, and not an inch or two, or a draught will be created that is certain to tell upon the health of all plants near. It is advisable to admit air from the top of the window rather than the bottom. Kentia Belmoreana, K. Australis, K. Fosteriana, and, indeed, all the kentias are most excellent, and cannot be beaten for elegant growth and general utility.

Chamædora elatior is another charming palm, with pinnate leaves. Several of the date palms are serviceable, notably Phœnix dactylifera, P. rupicola, P. reclinata, and P. sylvestris; these have leaves right down to the edge of the pot when young, and are perfectly distinct from the fan palms or the Cocos. Chamærops humilis, C. excelsa, C. Fortunei, Geonoma gracilis, Areca lutescens, Seaforthia elegans, and Caryota urens will be found both useful and of a moderately hardy nature. Palms are generally grown from imported seeds, sown in pots and placed in bottom heat, but this is chiefly done by nurserymen who make the business a speciality. Still, it is a very interesting phase of gardening to watch the development of the process, which can only be undertaken by those with the proper conveniences at hand. To preserve palms in health, care must be taken that the leaves are kept clean. Water only when dry, giving sufficient to thoroughly moisten the soil. Dust and draughts are two serious factors that have to be reckoned with after the plants leave their genial quarters under glass.

To maintain large plants in a robust condition, if they are being constantly used, requires an expenditure of energy and care, because they soon become infested with scale, and have to be fre-

quently washed and overhauled; inattention to these details means permanent disfigurement. When once a palm loses its leaf beauty it is extremely diffcult to restore it; the dry air of a room is not natural to them, therefore they must suffer more or less by the confinement, and if one possesses a greenhouse it is a good plan to change the palms and let them have a rest in the warm, moist atmosphere in which they are so happy. The best soil for the generality of palms is a mixture of turfy loam and peat, with a liberal quantity of coarse silver sand, but they will grow fairly well in any good potting compost. It is quite natural for some of the species to push themselves almost out of the soil. Such kinds in their native habitats, along the banks of streams and in swamps, sometimes rear their stems several feet above the surface level, in order that the matted substance of which they are composed should not rot with too much moisture. The smaller specimens sold in the markets are often brought along in great heat, and although they look bright when purchased, if placed directly upon the table they will soon commence to fall away. The best place for them is the greenhouse for a few weeks before using them in the house. The usual season for repotting palms is in the spring.

Grevillea. Dracæna.

BASKET PLANTS.

On the selection of the proper plants for growing in baskets or suspending in pots success or failure depends, and to lessen the labour of those who take up this interesting method of plant culture for the first time, we will endeavour to render their operations more pleasing and satisfactory. As to the baskets, of late years there have been great improvements in the style of this receptacle. Some plants thrive best when in a pot which is set into a fancy suspending basket surrounded with moss, others may be planted out in tightly packed mossy material into which they root freely. The bowls of rustic and terra-cotta are usually without any means of drainage, and unless care is exercised in watering, there is danger of the earth becoming sour. During suitable weather it is a great benefit to take all basket plants into the open air once a week, in order to clean them and thoroughly water such as require it, and directly they have drained they may be returned to their hanging quarters. We say once a week, but how often this immersion will be necessary depends upon the weather, the condition of the plants, and the quantity of rooting material in which they are placed. If they hang in a stove house or other building where they can be readily syringed, it will not be needful to move them to undergo the operation.

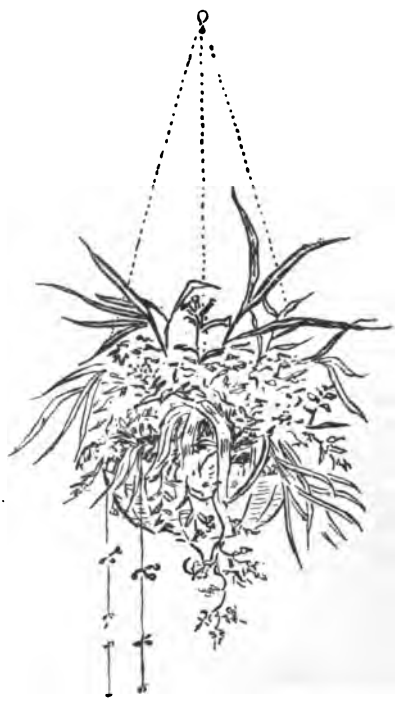
Among the best plants for baskets we may name Lysimachia nummularia, commonly described as Creeping Jenny; it produces long trails of golden buttercup-like flowers in early summer, and is very pretty. Another popular basket plant is Saxifraga sarmentosa, which bears the common name of Wandering Jew, or Mother of Thousands, from the numerous little runners that hang down in long threads. One type has showy variegated foliage. Tradescantia repens and Tradescantia discolour are suitable for dangling in front of the conservatory staging, whilst in a warmer house the curious glass-like Panicum variegatum is very effective. Ivy-leaved geraniums are splendid subjects, as

they may be trained to suit any form of trellis and carry immense trusses of highly-coloured flowers on long stalks, which are very pretty. The Chimney Campanula, in white and blue, is very ornate hanging in conservatories and cottage windows, and is grown in such places all over the country.

Some of the fleshy-leaved and variegated Mesembryanthemums are good for sunny places or along the fronts of stages. Convolvulus mauritanicus, with its pretty mauve flowers, and the tiny bind-weed (Convolvulus arvensis, of the waysides and cornfields, with its striped white and pink trumpet flowers, is charming grown in this manner. Maurandya Barclayana and Thunbergia alata, in dark-coloured baskets, Lophospermum scandens, Torenias of sorts with parti-coloured blue flowers, small-leaved Ivy for outdoor baskets, Manettia bicolour, Russellia juncea, with bright scarlet flowers, the beautiful Coccypselum discolour, with clusters of bright blue, Begonias, including the profuse Gloire de Lorraine, Tropæolums in flames of scarlet, Fuchsias as graceful droopers, Lachenalia peeping through the wires of mossy clumps, Lily of the Valley and Crocus similarly treated are all beautiful and effective in their seasons. Lobelias of the brightest blue, Petunias and Marguerites. Eccremocarpus and Calystegia. Ipomæa hederacea, with its ivy-shaped leaves, flowers abundantly when trained round the sides of baskets, whilst Cerastium tomentosum makes a useful white-leaved edging plant. Cineraria maritima or silver-frosted plant never looks nicer than when decorating a basket. Its leaves are among the most decorative we know of. Ferns, Lycopodiums and Selaginellas include many inviting subjects, some of them producing a rhizomatous growth, which soon covers the moss, and thrive for years in the same basket if kept moist during the warm and growing seasons (see page 99).

Begonias are very effective plants for filling baskets for suspending in the conservatory; in this way the drooping habit which many of them possess is seen to the best advantage. Several plants that have been grown in five-inch pots may be put together so as to make a show at once. Achimenes grown in baskets will also be very effective and continue to flower for some time if they are hardened gradually by placing them for a while where they will

receive somewhat more air than in the stove where nurtured. There are a good many flowering stove-plants that can be made to do good service in the conservatory during the warmer months of the year if care is taken in giving air to see that it is admitted in moderate quantity. There are a few plant houses where the occupants, particularly those that are planted out, stand more in need through the growing season of manurial assistance, which can be given in a liquid form; but in a conservatory it is not often possible to employ it freely on account of the offensive smell when composed of the ingredients generally used; but there are now several highly-concentrated inodorous manures which are effective in promoting vigorous growth in flowers.



FERNS.

A fernery should be attached to every garden, as it can be made one of the most interesting of spots to the lover of plants at a very small outlay. Ferns are such useful plants decoratively that no arrangement seems to be perfect without their aid. They are also very interesting for invalids, as some of them will grow where nothing else will, as in balls of moss, in bottles, on pieces of wood or cork, in rustic baskets, in shells, and in glass cases. Among the most popular species the maidenhair perhaps possesses first claims, and of this family Adiantum capillis veneris, A. cuneatum, A. formosum, and A. farleyense are general favourites and suitable for growing in rooms. A coarser-leaved maidenhair is Adiantum rubellum. Some of these are generally considered only satisfactory in hothouses, but this is a mistake; if inured to a cool atmosphere when young, they get accustomed to it and thrive well. Asplenium viride, the green spleenwort, is almost hardy and easy of culture, whilst Asplenium longissimum is a pretty drooping fern with very long slender fronds. Many of the aspleniums will grow on a shaded wall. The athyriums or lady ferns, most of the Pteris tribe, such as P. serrulata cristata and P. longifolia, are very hardy and serviceable. There are others with crested and plain fronds in great variety. Then there are the Davallias, or haresfoot ferns; Lygodium, or climbing fern; Camptosorus, or walking fern; Lomaria, so useful for rooms and halls; Osmunda regalis, or Royal fern; Allosorus crispus, the parsley fern; Polypodium dryopteris, the oak fern; Polystichum, or shield fern; Struthiopteris, or ostrich-feather fern; and Scolopendriums, or harts-tongues; Cheilanthes, or lace fern; Lastreas, or buckler ferns; all possess their varieties most valuable for decoration in cool places. Ferns can be grown from seed or by division of roots, and make rapid growth in a moist place. Seedlings may often be found in damp nooks and corners where large plants are located. These should be potted when sufficiently large, and grown on to harden the fronds and make them more durable before being taken in for room use.

Very few attempt to grow ferns from seeds, or spores—found in the brown dusty-looking stuff which comes under the fronds of most species, but to those about to do so, or that have tried and been

unsuccessful, a few hints may be very useful. Having obtained the desired spores, the first thing to do is to procure a seed pan, which should be from 5 in. or more wide, and also be clean and porous. They generally have five or six holes in the bottom; each one of these will require a piece of broken pot placed over it, and then a layer of charcoal, broken into small pieces about the size of nuts; a layer of moss, to keep the soil from clogging the drainage, and then fill in the compost, consisting of loam, fibrous peat, and leaf-mould in equal proportions. If there is no sand in the material a little must be added to keep the compost in a porous state. Endeavour to have soil a little rough on the top, filling to within 1 in. of the rim of the seed pan, which should then be removed to a greenhouse or frame. The seed should be sprinkled evenly on the soil, taking care to have a sheet of glass close at hand, with which to cover it, the seed being so light that the least breath of air will scatter it in all directions. The soil must be kept moist to insure the seed germinating, but that this may be done effectually, and the seed be not disturbed, simply set the pan in half its depth of water once a day, leaving it in for about fifteen minutes. Then remove it and place it in its former position; an intermediate heat or temperature is all that is required, except in the case of tender kinds that require a warmer treatment.

Some spores take a longer time to germinate than others, but generally, if sown in spring, they will be fit to prick off into small pots in the autumn. This, of course, depends greatly on the varieties, as some of the vigorous growing kinds will be large enough to prick off in half that time. The germination takes place in the course of five or six weeks from the time of sowing, and will at first appear as mere specks, requiring a very close inspection to even notice them. However, they will soon increase in size, and will look to the inexperienced eye like small pieces of green fungus all over the top of the soil, but this form is quickly followed by the shooting up of a small frond. At this interesting stage a little air should be admitted during the day, taking care that no insects or woodlice are permitted to enter, as they would destroy the tender fronds in a very short time. When the fronds begin to touch the glass it may be entirely removed, and when the seedling ferns are strong enough to handle they may be potted. In potting them, select the smallest pots available. The soil in which they are to be potted should consist of leaf mould, fibrous peat, and sand, in the proportion

of half or three-parts leaf-mould and the remaining portion peat and sand, with plenty of drainage material in the bottom of the pots. It has been generally observed that the varieties of ferns raised from spores are, with few exceptions, the same as the parent plant. But a few of the most lovely ferns are sometimes found in the seed pans of other and less valuable kinds.

For hanging baskets nothing lasts better than a fern, and some kinds are well adapted for this purpose, such as Woodwardia radicans, with its gracefully falling leaves. The Haresfoot ferns are all good basket ferns, some being exceedingly effective if edged with a pretty trailing plant, like Selaginella kraussiana or Isolepis gracilis. Then there are the Japanese ball ferns, which are simply soaked in water and hung up. When established they are very graceful, and in summer can be utilised anywhere. All ferns prefer shade to strong sunshine, and plenty of water which can readily get away. Chief amongst the Maidenhair for baskets and creeping are Adiantum amabile, A. assimile, and the British species, A. capillis veneris. Next are the Aspleniums or Spleenworts. Davallias or Haresfoot ferns, the most prominent of which is the Japanese species (D. bullata), just now so largely sold in the shops, made up in balls and other fanciful and grotesque designs, as referred to above. In Microlepia cristata we have another charming thing, and the easily-grown Nephrolepis exalata. Pteris scaberula seems to establish itself naturally on the outside of fern baskets, and others of the extensive Pteris family are very popular. The Hartstongue fern, Scolopendrium vulgare, Polystichum, or Prickly Shield fern, the Scale fern, and the Killarney fern, Trichomanes radicans, all do admirably in cool windows, each having fronds of a fascinating hue. Although not ferns, the following are always more or less associated with them: Lycopodium denticulatum, Selaginella apoda, S. kraussiana, and S. cæsia arborea, and many other species. Platycerium alicorne, commonly called the Stag's-horn fern, is not a fern, but is ofter found in ferneries. It thrives well on a piece of cork fastened on the wall, and looks like green stags' horns protruding therefrom, increasing in size with age. There are other types equally as attractive.

When a selection has been made for placing in baskets, first put a pad of sphagnum moss all over the inside of the wire to prevent the soil washing through. The compost should be rather rough, peat

predominating, with broken charcoal, loam, and sand, say, one-half the first-named and the other in equal proportion. Set the plants so that the crown, *i.e.*, the base from which the leaves shoot, is just above the level of the sides of the basket, fill in with the soil, and then press some moss round the upper edge, so that the soil will not wash over when the plant is watered, but by far the best way of giving water to a basket plant is to dip it into a tub about three-fourths down and let it stay for half an hour, draining it for another half-hour before hanging it again. Little pieces of the Lycopodium just referred to may be put into the top of this basket; it will quickly root and spread, giving a bright green coat to the whole arrangement.

With regard to the association of Lycopodiums and Selaginellas with ferns, amateurs very often fail in growing these beautiful and easily-managed plants through exposing them to too much light and air. The delicate foliage will not stand rough treatment with impunity, for it soon assumes a brown rusty colour, to prove to the cultivator that it is not receiving the right kind of treatment. The plants are propagated by cuttings and divisions, and thrive best in pans about 6 in. deep, well drained and filled with a mixture of fibrous peat, loam, and leaf mould in equal proportions, with plenty of silver sand. Although there are many more splendid kinds, the following are most suitable for an ordinary plant house: Selaginella apoda, a pretty little dense-growing kind, requires care in watering, otherwise it will go rusty in the centre; S. denticulata, an old species, very free growing, and one of the most useful; S. cuspidata, with pretty foliage formed into the shape of a bird's-nest; and S. cæsia arborea, with its handsome trailing growth of a rich glaucous green turning almost white with age towards autumn.

We can fancy hearing some of our readers ask the question if all these beautiful ferns can be grown in an ordinary greenhouse, and our reply is that "some can and others cannot." If ferns are to be grown so that they are a credit to the cultivator, to have that fresh green colour which adds so much to their charms, they must be grown in a subdued light, combined with a moist atmosphere. There are many plant-houses in the suburbs of our cities and large towns, stowed away in nooks and corners where it is impossible to get sufficient sunshine for the growth of ordinary things, and how

miserable it is to go into such a structure and see a few wretched occupants struggling to reach the distant light and air! This is just the place for ferns to show off their fullest beauty, and it only requires the lady of the house to effect some tasty arrangement with old tree stumps, rough blocks of wood, and virgin cork, filling up the chinks with pieces of fibrous peat, and display the ferns, some in pots, others in the soil. Syringe the house once a day in summer, and give an opportunity for surplus waterings to get away, when happy will be the result.

ON SEEDS.[1]

Seeds are of many descriptions. Some will grow almost anywhere, others require the most delicate handling. The more highly-bred a plant is, often the more tender are its seeds, not only in composition but also in germinative power. Too much care and attention, again, is a frequent cause of failure. Seeds found by some to be difficult to raise in pots, thrive luxuriantly when scattered over a bed of damp ashes in the greenhouse, simply because they were not coddled or sown in a finely sifted mixture of soil, mixed up like so much plaster of Paris. Then, again, there is the point of quality, as some plants cannot be known by their seeds. Take cabbage and turnip; it is only experts that can determine the difference between them, and it would be just as easy for the merchant to supply the common field charlock for one or the other without the purchaser being cognisant until he had lost the season. This is why it is recommended to procure all seeds from a reputable source. Vegetables of high-class quality cannot be grown without first sowing reliable seeds; it is exceedingly annoying, after preparing, sowing, and cultivating, to find that instead of having spent time and money profitably, one has lost heavily in obtaining an inferior article. There are plenty of cheap and worthless seeds as well as other commodities in the market, and it would be always advisable to guard against them.

Some cultivators, through forgetfulness of the fact that the products of a garden, being natives of various soils and climates, require peculiar management, sow the seeds in the ground at improper seasons. All cohesive soils, from the tenacity with which they hold water, require both frost and March winds to crumble them down to that fineness suitable for seed sowing. In any soil the early and most hardy vegetables should not be planted until the ground can be brought into good condition, as some species that in an advanced stage of growth will stand a hard winter, are often cut off by a very slight frost while young. Some seed, such as beans, cabbage, lettuce, radish, turnip, etc.,

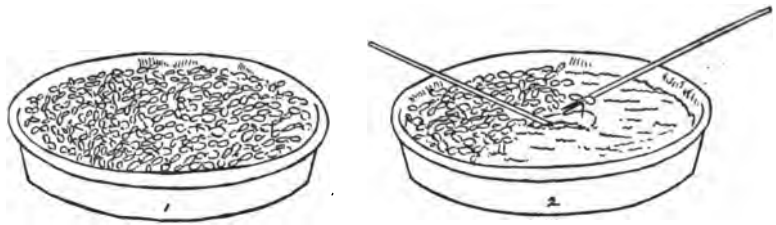
being from their nature apt to vegetate quickly, are often destroyed while germinating through variableness of the weather, and some are liable to be devoured by insects in a few hours after they have sprouted and before a growth is seen above the ground, unless a suitable remedy is applied in time. Others, such as beet, carrots, celery, leek, onion, parsley, parsnip, spinach, which take from two to four weeks to germinate, will sometimes perish through incrustation of the soil, or other untoward and unaccountable circumstances, which cannot be controlled.

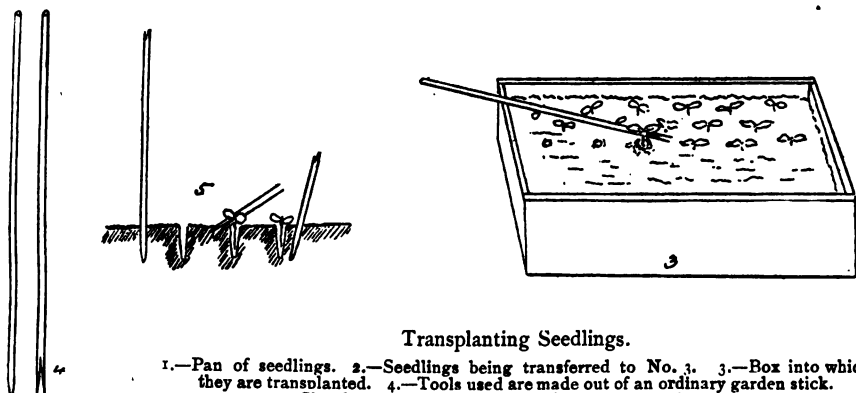
Failures often occur through seeds being deposited too deeply in the ground, which weakens their germinative power, or left too near the surface to become dry after vegetation has commenced. Sometimes for the want of a proper quantity of seed in a given spot, solitary plants will perish through not having sufficient strength to break the surface of the earth. Other failures are the prematurely going to seed of certain vegetables, as lettuce, endive, spinach, etc. The reason in most cases is to be found in sowing too thickly, and in leaving the plants which are to be transplanted too long in the seed bed, or in thinning them out too late, inducing a consequent weakly and "drawn" up growth if they are to be left on the spot; often also in checking the growth by keeping them too dry. Many seedlings "damp off" when sown too thickly.

A common cause of disappointment is sowing in too rich a soil. In such cases the seeds are often "killed with kindness." Too poor a medium cannot be employed in which to vegetate seeds, so long as it is healthy and contains sufficient moisture to keep the growth alive. It is well to bear in mind that much of the future success of a plant, as of an animal, is due to the treatment it receives when young.

In some sowings of seeds made during dry weather, with a drought following, a total failure often occurs from neglecting to firmly press or roll them in, so that when they germinate the action of the heat and drought may not dry up the germ. It is nevertheless advisable never to tread or roll in seeds when the ground is wet and sticky.

It is difficult to give a fixed depth at which seeds shall be sown, as much depends upon circumstances. Some writers recommend





Transplanting Seedlings.

1.—Pan of seedlings. 2.—Seedlings being transferred to No. 3. 3.—Box into which they are transplanted. 4.—Tools used are made out of an ordinary garden stick. 5.—Showing minutely the method of transplanting into No. 3.

them to be put in the soil as deep as their diameter measures, but this is not sound advice. Take peas, for instance; it would mean that they would only be just covered. Such as celery, lettuce, mustard and cress, and grass seeds should just be hidden. Cabbage, cauliflower, broccoli, kale, brussels sprouts, savoy, turnips, radish, carrot, onion, beet and parsley should all be less than half an inch deep. Spinach may be sown a little deeper, early round seeded peas about two inches deep, marrowfat peas from three inches in heavy soils to a little more in light soils, dwarf and climbing beans about three inches, and broad beans about four inches.

When seeds ripen in a natural manner and fall to the ground not one in a hundred gets the smallest chance of germinating, because they lie on the surface, at the mercy of insects and birds. Some that survive until the next growing season, through being preserved from attacks by leaves, dropping into cracks or under stones, are still liable to be eaten off by the larger animals when growing, and it is only the few that do not get molested that reach maturity. This explains the difference between seeds sown by Nature and needing no thinning-out, as against those sown by man in an artificial manner upon highly cultivated ground.

If seeds are sown too thickly, and germinate freely, the seedlings have not the room to develop a healthy growth necessary for the production of perfect plants; hence, if left, they would stifle one another, and become an easy prey to mildew and other diseases through being overcrowded. To prevent this waste, some judicious process of thinning-out is resorted to, the operation being undertaken before any damage is noticeable. This work is largely attributable to the fact that nowadays the growing properties of seeds as distributed by the best firms are of the highest order; that is to say, with all the common vegetables and flowers 99 out of 100 may be expected to produce a perfect plant if the surroundings are favourable. Many years ago seeds were considered good enough if they produced a growth of 50 per cent., and it is still the opinion of some that amateurs whose ideas of sowing thinly differ so materially, would be likely to meet with better success if only one-half of the seeds came up.

THE ANEMONE.

The beauty of a bed or border of anemones in the early spring-time exceeds that of many other flowers; but to obtain this in perfection the nature of the soil must be the first consideration. Should the natural formation be heavy or stiff, it must be mixed with coarse sand or road-scrapings and enriched thoroughly with well-decomposed cow-dung, stirred to the depth of fully eighteen inches. October to March is the best season for planting, and this should be done in straight rows, a foot distant from each other. The plants in each row may be of one colour, the roots nine inches apart, and two inches deep in the soil. By planting thus, and properly arranging the various colours, a beautiful contrast will be obtained. Should the weather prove dry in April, a good soaking of water, given occasionally, between the rows, will be beneficial. Like the ranunculus, they will bloom in succession from April to June, commencing with the scarlet anemone fulgens, followed by the single poppy varieties, and the brightly coloured Irish St. Brigid type. As soon as the leaves decay, which will be in June, of those first planted, the roots should be taken up, the decayed parts and the earth cleared away, and, having been dried in the shade, they should be put in some secure place, perfectly dry, and particularly where mice cannot obtain access to them. This opportunity may be taken to part the roots for increase, and, provided each piece has a good eye, or bud, it will grow and flower, but they will not bloom so strong if parted small. The roots become weakened in some soils if suffered to remain long in the earth after the leaves decay, and they will keep for two, or even three, years, and grow when planted again.

When grown in pots, the roots can be set out in the open ground to ripen off and remain where they may be useful another season in supplying flowers fit for cutting, but they will hardly be good enough for showy beds, as they often deteriorate.

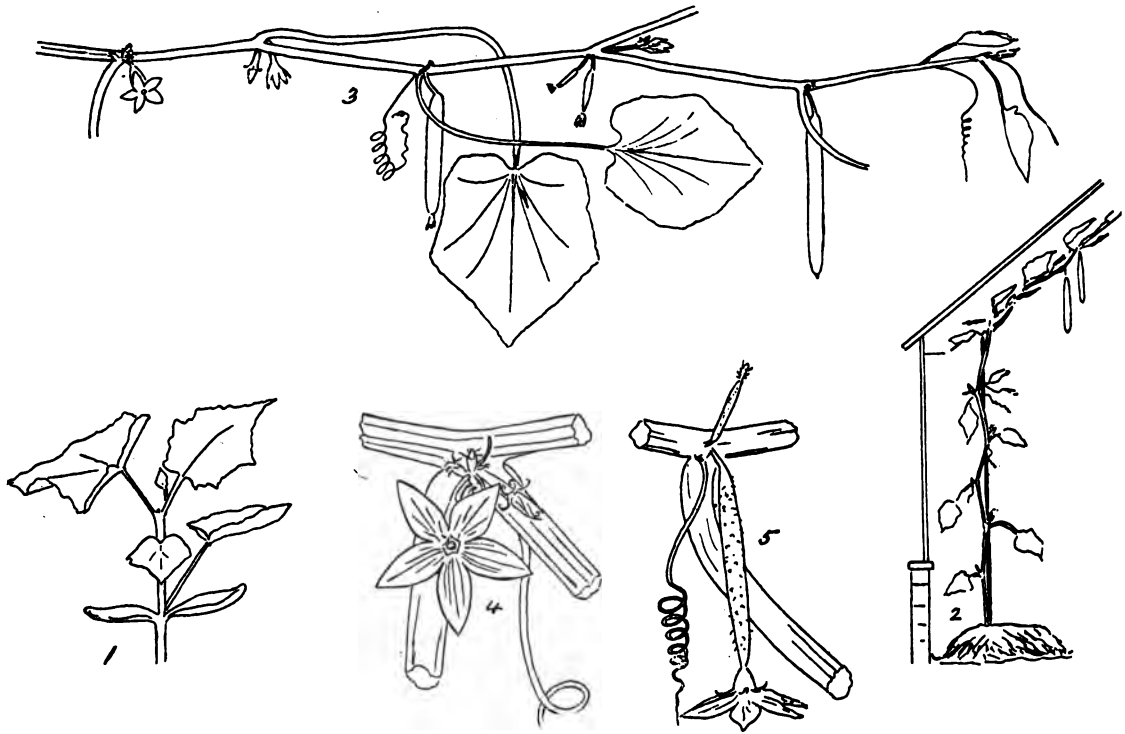
Anemones are readily grown from seeds which very much resemble flock. It should be sown in a pan and kept in a cool frame, and the seedlings transplanted into a box a couple of inches apart.

THE CUCUMBER.

There is often much to be learnt from the sayings of old-time writers, quaint as their expressions may be. A century and a half ago no collection of books was considered complete without its copy of Culpepper's Herbal, in its day the leading authority upon all matters relating to herbs and medicinal plants. In the matter of the cucumber, this old physician held a curious opinion of its value as a food product when he says of the fruit, "Cut it in slices, season it well, then throw it back on the dung bed from whence it came." It will be conceded that there may have been some amount of wisdom in the old expert's advice, because in his day, no doubt, the cucumber had a prickly and corrugated skin, while the inside was of a hard, tough texture, and required the constitution of an ostrich to digest it. It is not believed that he would have recommended the same drastic measures with the thin-skinned succulent-fleshed varieties we are accustomed to set upon our tables at the present day.

Although in its young stages the culture of the cucumber is very similar to that of the melon, it differs as the plants mature, the fruit of the cucumber being eaten when green and succulent, while the melon remains on the plant until fully ripe, and requires a longer time to develop. It is at the height of summer when cucumbers are most in request, yet in large establishments they are available all the year round; indeed, one variety has this description attached to it. For the present purpose we are more identified with it as a refreshing and welcome dainty during the hottest months, when it adds a zest and gives a relish to dishes that, without it, would probably remain untouched. It is one of those fruits, like the tomato, rarely liked at first, but becomes quite appetising upon acquaintance.

Some gardeners sow the seed at the turn of the New Year, but to the ordinary cultivator the point must always remain a matter of convenience, to be regulated according to means and requirements. The grower who merely needs a supply in summer may



The Cucumber Plant.

1.—A sturdy young plant. 2.—Its appearance when trained and in bearing. 3.—Showing growth more minutely. 4.—Male blossom. 5.—Female blossom.

sow the seed in March in the manner already recommended for melons. As soon as the seedlings are up they must on no account be stood in a draught, or in any situation likely to give them a check, but kept in a warm atmosphere (60 to 70 degrees), loosely potted into 48-sized pots when in the fourth leaf (see illustration), and transferred, say, in May, to a raised bed in a house, or to a frame, just as recommended for melons. Those intended for house culture, when separately planted in clean, loamy heaps of soil about 4 ft. apart, must be staked and conducted on a single stem up to the wires or trellis, and directly the growth has reached these supports the point may be pinched out; this will induce other shoots to break, and these, in their turn, when about 2 ft. long, should be stopped, this operation being carried out gradually, and not at one time all over the plant.

As with the melon there are two types of blossom, the male and the female. (See illustration on opposite page.) The former is only required when the fruits are needed for seeding purposes, but it is usual to leave a few of them on the plant. The female flowers carry the small cucumber behind them, and do not appear until the plant is sufficiently established.

If more than one appears at a joint it is preferable to take the duplicates away, and also the spiral tendrils. (See illustration.) A curious custom with gardeners is to retain the withered flower at the end of the fruit when cut and sent to table. It gives it a fresh appearance—some judges will ignore good fruit on the exhibition board if this appendage is absent—and when handling the fruit they always wrap one of its own leaves round it, as it helps to preserve the "bloom," as they term it, on the skin. These little matters receive no attention whatever from the greengrocer, but are points of great importance in first-class establishments.

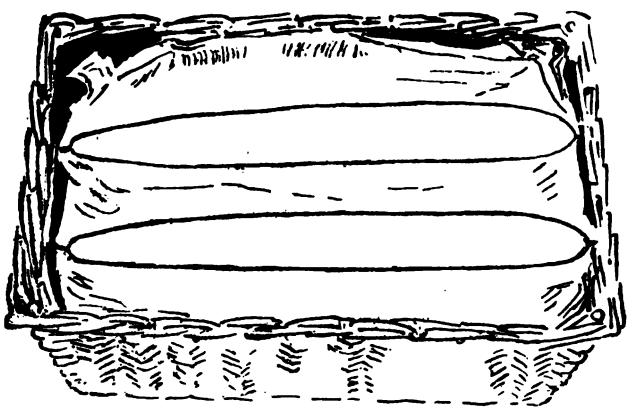
As the plants get into bearing the roots will spread about the bed, like so many white threads, and fresh soil should be added for their support. The atmosphere must be kept more humid than is recommended for melons, as the quicker the fruit swells the nicer will it eat. Ghecks through drought at the roots are largely responsible for that bitter taste often attaching to the cucumber.

When the plants are thirsty the leaves droop, and unless the surroundings are kept healthy with water, and a proper supply of fresh air on hot days, the red spider will soon appear under the leaves, which turn a sickly green, and the pest can only be kept down by constant syringing morning and afternoon with tepid water, before and after the sun is at its greatest power. Mildew, a fungoid disease which comes on the leaves, is generally due to sudden changes in the temperature of the house. The overcropping of the plants should be avoided, as it is one of the evils in the culture of fruit bearers of this description to let them carry all that are produced. Nothing tends to shorten their life so quickly, and the specimens are not nearly so fine in looks, shape, or colour, as if but one or two are left on a branch. Cut fruits may be kept fresh for some days if a piece of stem remains attached, and this is placed in water.

The cucumber is easily grown in a frame, on a raised mound of good soil, and does not require nearly so much warmth as the melon. Nevertheless, a nice moist heat, with plenty of air on hot days, is advantageous. The frames are generally syringed early in the afternoon and then closed up; a good deal of the sun's heat is retained in this way, which is helpful. In order that the plant may entirely cover the inside of the frame, the shoots must be stopped so that others may be induced to fill up blank spaces, and the swelling fruits laid on pieces of wood or something to keep them off the bare earth. Some put over a shading during the hottest hours, but this is not necessary, if plenty of moisture and air are given. A toad kept in the frame will catch all the vermin likely to be injurious. The production of cucumbers for winter use requires knowledge, and should only be attempted when all the necessary accessories are available.

There are three types cultivated in our gardens, the most prized being those produced in houses, where the fruits can hang down. In this manner they grow better shaped and evenly coloured. The cucumber has been so vastly improved during recent years that the modern forms, as offered by our leading seedsmen, are both symmetrical, smooth, of a rich glaucous colour, almost without neck or handle, and their number is so bewildering that it is difficult without knowledge of all requirements to determine the

most suitable. The variety called "Telegraph" has had a great run for many years; it is a free bearing sort, rather pale in colour, but seems to thrive just as well in a frame as in a house. Then some of the best ridge or outdoor cucumbers will give fruits over a foot in length. The gherkin, or pickling cucumber, is generally grown like a vegetable marrow, being raised under glass, but should not be planted out until June, or a week or so earlier, if summer seems to have set in.



A brace of Cucumbers.

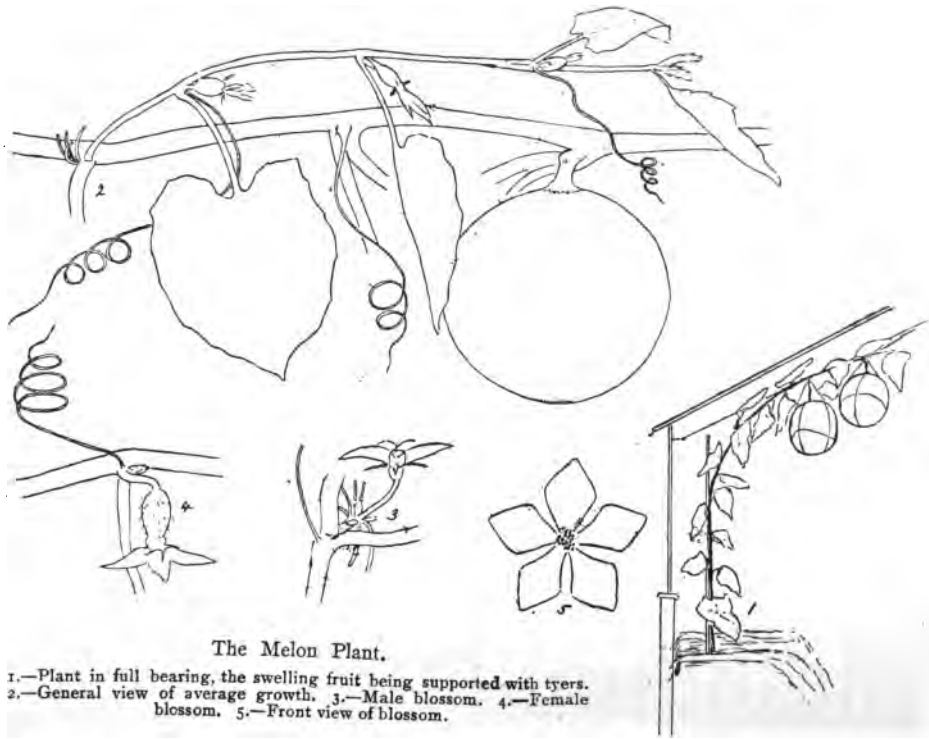
THE MELON.

A melon, when well grown, is a delicious fruit. The coarse, ungainly specimens sold in the shops during summer are produced in more sunny climes, where they thrive with little trouble, and in such quantities as to be offered at a price that would scarcely pay the cost of carriage upon the home-grown article. Some are highly-flavoured, others are not worth eating, and none are so choice or pleasing in appearance on the table as those raised under glass in our own gardens. The cultivation of the melon has long been an important duty of a gardener, and to bring the fruit to a high state of perfection requires considerable knowledge. As grown in large establishments, the plants, by various sowings, are kept in a state of bearing almost the year through. The structure favoured in such places is either a lean-to or a low span-roof house, where the plants are rooted in prepared turfy beds and trained up to the trellis near the glass; under this method the fruit hangs down. Failing such conveniences, the melon is grown in the old-fashioned way in a frame, where it requires judicious airing, watering, and husbanding of the sun-heat, in the absence of warmth artificially supplied. The season for melons with amateurs extends from the end of July to the middle of October; they may be had later, but the fruit is likely to be inferior to those ripened when the days are long and the sun powerful.

The most simple plan for sowing in March is to put eight seeds on their sides in a 32-sized pot, well-crocked, and three-parts filled with light fibrous loam-soil, which has been warmed, and quite a quarter of silver-sand added. After one good watering, the pot should stand to drain for an hour, then plunged into a prepared bed where there is bottom-heat. In the absence of a hotbed, it may be made up as follows: Get a deep, narrow box, pack it with fresh horse-manure, put a couple of inches of soil at the top, and into this insert the pot half-way; under normal conditions it should generate sufficient heat to induce the seeds to sprout. Another system that may be adopted is to fill a similar box with cocoanut-fibre, kept damp, and stand it on a warm hot-water pipe.

Insert the pot of seed almost up to the rim, put a piece of glass over the box, and wait for the seed to germinate in a week or so. As the seedlings mature they should be brought nearer the light and the glass removed. When in the third leaf pot singly into 48-sized pots, in rich loamy soil, with less sand than before (not too firmly); when starting to grow they must be staked. The aim is sturdy, short-jointed plants, which are only to be obtained by a steady heat, say from 63 to 75 degrees, and careful ventilation at suitable hours on fine days. Top air is safest early in the season, as a cold draught through the house gives a check from which the tender seedlings seldom recover. As soon as established in these pots, those intended for house culture should be transferred to permanent quarters. The following method has been found satisfactory: Lay down, say, four old boards, each 6 in. wide, and from three to four feet in length. On this foundation put a bushel of nice fibrous loam. If there is a stack of it in the garden chop some down with a spade, but do not sift it; make this into a firm mound just where you wish each plant to be set, and in the top centre make a hole large enough to take a peck of finer soil with leaf-mould and sand in it, and warmed. Into this the plants may go, about three feet apart, and it is advisable to sprinkle a little wood ashes close around, both under and on the surface, to keep wireworms away, if any are in the soil. When the planting is complete, water with tepid water; shade and keep the house close for a few days. This operation takes place during a warm day in May.

Train the plants on a single stem (see illustration, page 114), taking the point of the growth out when it has made half a dozen leaves up the trellis. Side shoots may then show themselves at the leaf joints; these should be encouraged until it is seen if they are likely to be fruitful. First of all come the male flowers and the female follow; the latter may be distinguished by the semblance of a fruit behind them. When one of these appears the shoot may be stopped at the point, and a few days later, as soon as the fruit swells a little—sometimes they go off yellow—it may again be stopped to two leaves in advance of the fruit. Care must be taken not to injure this blossom. Some growers deem it necessary to fertilise it when fully expanded with the pollen taken from the male flower; this operation should take place when the atmosphere of the house is dry, in midday sunshine. A small camel



The Melon Plant.

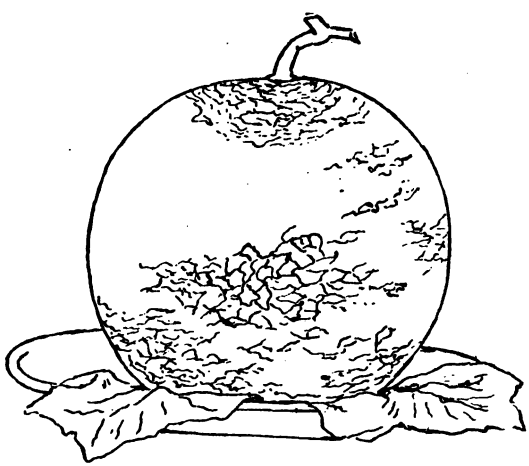
1.—Plant in full bearing, the swelling fruit being supported with tyers.
2.—General view of average growth. 3.—Male blossom. 4.—Female blossom. 5.—Front view of blossom.

hair brush rubbed on the male is transferred to the fruit bearer with the powdery pollen on it, and it is considered to greatly assist the setting of the fruit. All side shoots that do not appear to carry fruiting flowers should be stopped at the first joint near the base to again throw out another shoot, useful in a naked space in the trellis that wants filling up. Give good supplies of tepid water as required when the bed looks dry—perhaps twice a day in hot weather—and do not let each plant carry more than half a dozen swelling fruits. The surroundings should be kept fairly moist, but not drenched, as is often the case, or the dreaded red spider will appear and do irreparable damage if not speedily checked with the syringe. When water is given it should be tepid, and not applied near the main stem, but to the young feeder rootlets which will be seen pushing about all over the heap if the surface is disturbed. It is these that want the liquid food. When they show to any extent another layer of rich soil may be laid on. Some do not recommend this plan, but others have found it beneficial. When the fruits are reaching the ripening stage increase the ventilation and decrease the waterings, but sufficient must always be given to preserve a healthy and robust foliage, as upon this largely depends the quality of the fruit.

When melon culture is attempted in a frame, although much depends upon the size of the plants when put out, the most important point is the manner in which the bed is made. A gardener who knows but little about the work will pack in a lot of crude manure, adding some soil; then he gives it a good soaking with any cold water available, and in a day or so it is considered ready. This delicate sub-tropical plant might just as well be planted in the bottom of a pit as try and get flavoury fruit in such uncongenial surroundings. Melons in a warm climate are given a rich bed in a well-drained sunny place, and whilst they thrive on plenty of water during growth, the more the heat can penetrate to the roots without burning them the better does the plant succeed. There is no fear of the growth being scorched, because the leaves are shaped by Nature like so many umbrellas, which shade the ground from parching, but not warming influences, and under these conditions it thrives luxuriantly. On the other hand, if the roots have to peregrinate into a mass of cold moist earth, so consolidated that the strength of the sun cannot get down to them, how is it to be expected, even if the plants produce fruit, that they will be edible?

Little hillocks should be made of nice warm soil, as recommended for house culture, but not quite so high; and similar treatment throughout is recommended, except that the main growth should be stopped when about a foot in length; this will induce other shoots to spread about. In such a place it is not advisable that the fruit should lay on the ground, but on top of an inverted flower-pot.

Both the skin and the flesh of the melon differ in appearance, some being quite plain, others prettily netted, some turning a rich yellow when ripe, others a yellow green; whilst more are almost cream-shaded. In colour the flesh is white, green, or orange-red—seedsmen call them scarlet. The white flesh has the worst reputation for flavour; a well-ripened fruit of the green flesh is classed first by epicures; the orange-fleshed is the most attractive on the table, and by some preferred in flavour. With well-grown fruit the point seems quite a matter of opinion, but the latter is the most largely grown of all. The period of ripening is generally recognised by some cracks near the neck stalk, and also by a musky odour which is often perceptible some distance off. They will keep for several days in a cool, shady place, but soon go off, when cut, if put in a hot sunny position—so common with gardeners to give, as they say, a "finish off."

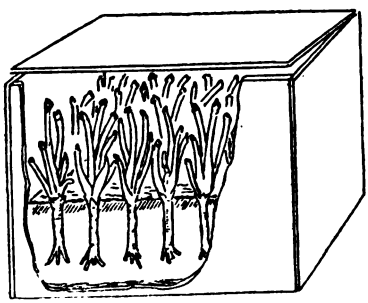


FORCED VEGETABLES.

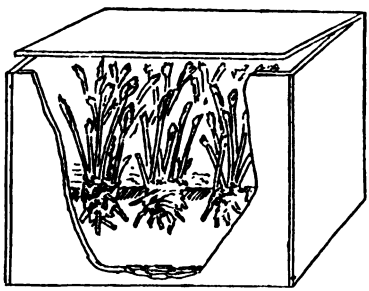
It is in the depth of winter, when all vegetation is usually rendered stagnant by the lack of genial warmth and bright light needful to its development, that the gardener is obliged to fall back upon such plants as are most susceptible of artificial aid for the supply of the vegetable delicacies required out of their usual season. The tender blanched stalks of sea-kale are always a welcome addition to the dinner-table. A notion prevails among amateurs that it is a vegetable requiring skill in its culture, and only to be enjoyed by the favoured few, but this is entirely erroneous. It may certainly be out of the power of some to be able to produce it by forcing, but there is no difficulty to ensure a supply in every garden later on when the increasing warmth of spring finds the necessary needs to ensure a quick growth.

Here is a method as to forcing for early use: Procure from your seedsman as many of the strongest roots as will answer your requirements, bearing in mind that a dish will need not less than four heads, which often means the sacrificing of four roots. These forcing stumps are then taken and placed thickly together—say three inches apart—in large flower-pots filled with rich soil, and the remainder are laid in loose soil in a cool place ready to draw from for successive supplies. In this way sea-kale is ensured until the growth comes on under correct treatment out of doors. Those which are potted up have an inverted flower-pot of the same size put over them, the hole in the bottom being stopped up. This system affords a very convenient form for bringing along a few dishes at a time; the pots may be put in many warm places out of the way, such as under the stage in the stove or greenhouse, or on a hot-bed, the latter being prepared by simply making heaps of fermenting stable material, leaving the middle open, in which to place the pots, with plenty of long straw on the top to exclude light.

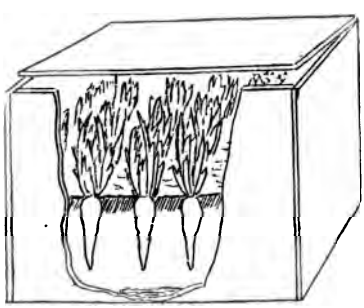
To have radishes as early as possible, recourse must be had either to a structure of this kind or hot-bed frames, with the



Forcing seakale in an ordinary box.



Forcing rhubarb in an ordinary box.



Forcing chicory in an ordinary box.

Watercress in pot standing in pan of water.

assistance of which they may be in perfection throughout the winter, and such a bed is usually made as follows. Put up a pile of fresh dung and leaves about 3 ft. in height (which will sink to 2 ft.), likely to produce sufficient heat to promote the germination of the seeds, cover it with about 6 in. of loamy soil, slightly firmed, and on this sow the seeds thinly, using either the early round-rooted type or the dainty little French breakfast variety. Some sow lettuce seed in the same bed, and the plants of these come along after the former are over. The seed of the radish requires to be buried a little deeper than the lettuce; therefore sow them first and rake well into the soil, beat the bed down slightly with the back of the spade, then sow the lettuce seed very thinly, pressing it into the soil. Air must be given daily in favourable weather, and as regards watering, one small supply after the seed is sown is usually sufficient at this season. Save the young lettuces that are thinned out for use with other salads, and they will be found appetising. The young tops of the radishes are also useful when chopped up in a salad.

Mustard and cress are largely grown as a winter salad, but it often happens that the so-called mustard sold as such on the markets is not mustard at all, but another plant, not nearly so pungent, that does duty for it, chiefly on account of the cheapness of its seed, which is nearly black. These are best grown in flat boxes, and by the methods of culture which have already been discussed in these notes. Cultivators of chicory, now that the growth has died down, may lift the roots, which in a selected stock have the appearance of white carrots, and stack them in a dark warm place in alternate layers of sand, with the tops of the roots only appearing above the surface. In such a place, particularly if the temperature does not fall below 50, they will throw up tender leaves in the greatest abundance, and under this system we have seen a fine blanched winter salad produced, tasting very much like endive, but more refined. It should be mentioned that the sand should not be dust dry. We have also seen it grown in hot-beds with nine inches of short straw laid lightly on the top; into this the leaves shoot, struggling for light and air, perfectly blanched and very crisp (see next page).

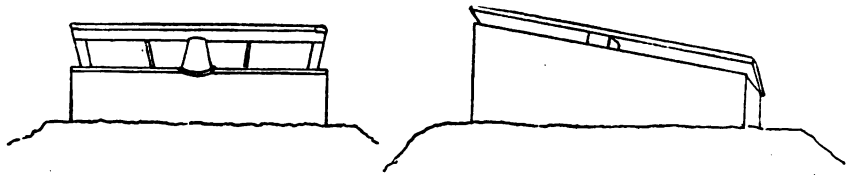
Lettuces can be readily grown through the winter in a dung-bed with about six inches of sandy soil between the dung and the

plants, topped with about an inch of fine sand. The seeds of a quick-growing cabbage lettuce are then sown very thinly, pressed in on the surface, the lights placed on the frames, and little or on air being given until the seeds vegetate. As the young plants increase in size they are thinned out and eaten. More air is given on fine days, and the result should be pleasing.

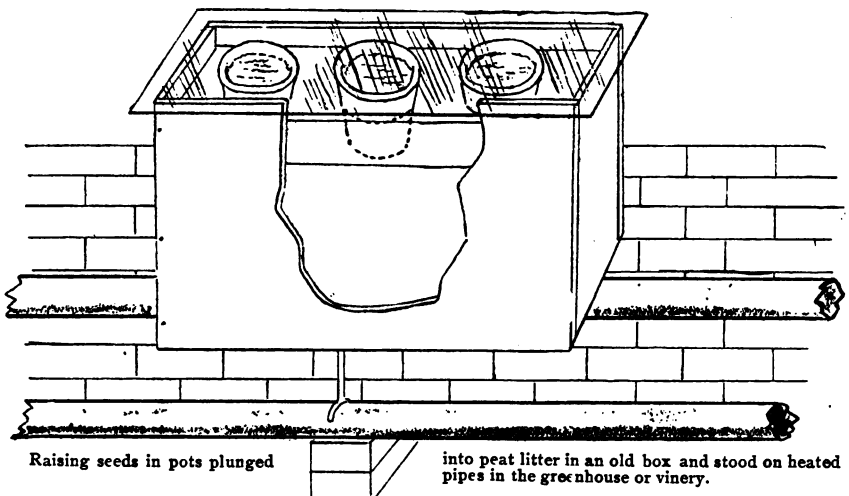
Mushrooms may be readily obtained throughout the winter in a dark shed, through which hot-water pipes run, by filling boxes, pots, or anything that will hold together, with a compost made chiefly of matured horse droppings and fine earth, well trodden into the receptacle, and pieces of spawn about the size of a hen's egg put in six inches apart and three inches below the surface, when the rank heat that is generated is upon the decline. An inch of nice soil laid over the surface and gently pressed down is helpful.

The want of a regular humid medium is the chief cause of failure in mushroom culture. When the bed is kept too dry the spawn will not run freely, and we have known the contents of the boxes being thrown away on the rubbish heap as useless, and a bountiful crop of mushrooms have sprung up during the ensuing summer. Too much moisture is another cause of certain failure; there must be a happy combination of both.

During June a piece of rich ground should be prepared for the reception of the seeds of chicory. This plant, one of the most agreeable and wholesome of all salads, is almost unknown here as a cultivated plant. On the Continent whole fields are taken up with it. It should be sown on a rich piece of ground in rows a foot apart. When the leaves begin to cover the ground thin out the plants to 6 in. apart. Those that are pulled out may be planted into other beds at the same distance as those which remain. Keep clear of weeds, and if the leaves grow very strong through a lengthy spell of hot weather and shade the roots too much, cut some of the lower ones away. The beginning of October is the proper time to lift the roots, which somewhat resemble parsnips; the larger leaves should be cut off with care, so as not to destroy the hearts in the centre; then shorten the root points and plant them in portable boxes with lids, very close together, and half-filled

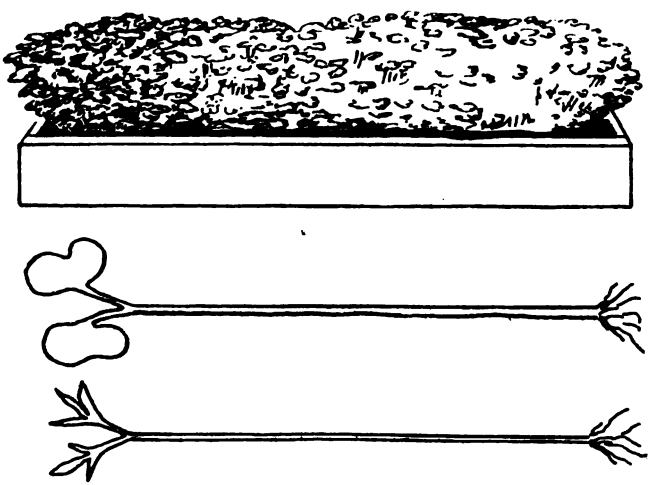


Giving top and side air to a hotbed.



Raising seeds in pots plunged into peat litter in an old box and stood on heated pipes in the greenhouse or vinery.

with rich soil; give a little water, stand in a shed, and protect from severe frosts by a light covering of litter. After they are established the boxes, as wanted, are to be removed to the mushroom house, or under a greenhouse stage if dry, where they must be entirely excluded from light in order to blanch the leaves. If the roots are strong each box will bear cutting twice, after which they should be removed and changed for a succession, as the leaves, when old, become bitter. In a fair heat it takes about a month to become fit to cut, and makes a delightful salad similar to the white hearts of a cos lettuce, but very much softer and more delicate. Served with the usual mayonnaise additions it is most appetising.

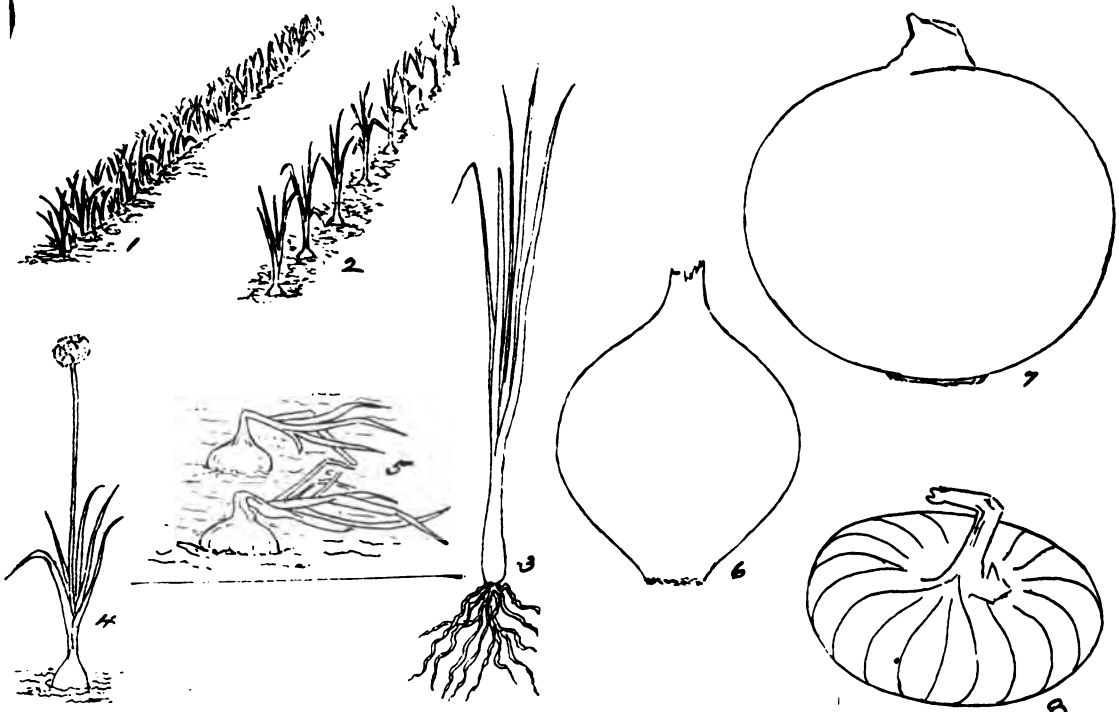


A Box of Mustard or Cress ready for cutting.

THINNING VEGETABLES.

A liberal thinning-out at the proper time is one of those points in the production of vegetables which ought never to be lost sight of. Such crops as onions are often left to be thinned out gradually, those pulled being used as spring onions. There can be no objection to eating the surplus; it is the delay that is likely to be injurious by hindering the well-being of those required to make large bulbs. Peas are another crop always sown too thickly, but it is often necessary, as they are so subject to the attacks of all kind of vermin, as well as birds. A well-grown pea plant, instead of throwing up a single stem with a few short branches, will come quite bushy if given plenty of room, and produce a much larger quantity of pods than is usual. It must have space as well as a well-prepared rooting bed, and it will then have a constitution likely to defy all extremes in the weather. Turnips and carrots should be thinned out to from six to nine inches apart, according to the variety. Spinach, when required to stand long, is another vegetable that repays a good thinning, giving treble the leafage than when allowed to remain as thick as a mat. Potatoes are often planted so close that when in full growth sun and rain are unable to warm and moisten the roots, and the tubers get no larger than marbles. The amateur who likes to see the nicest of vegetables on his table should bear in mind that they cannot be obtained without a liberal allowance of room while growing.

The same is true of flowers, especially annuals, which custom permits to stand a good deal too thickly, with the result that they are condemned as weedy and short-blooming subjects little worth care and attention. An inch space is generally given a plant where a square foot would not be too much for its proper development. A single specimen of any of the ordinary types, if well-grown in deep and fairly good ground and permitted to develop itself freely in all directions, will form a shapely bush perhaps two feet through, and produce hundreds of flowers of great substance, and if these are kept cut away directly they fade, others will extend the blooming season over some months. This is the only way to see the popular flowers at their best, in size, colour, and general beauty.



Onions.

1.—A row of seedlings. 2.—The same, thinned. 3.—One of the thinnings. 4.—Onions going to seed.
5.—Necks broken down to check upward growth. 6.—Oval shape. 7.—Globe shape.
8.—Flat Tripoli Onion.

THE ONION.

The Onion is one of the most important of garden crops, and though possessing such a strong and piquant flavour it takes a leading place in the mysteries of cooking. Being of sub-tropical origin it often fails to succeed in cold and heavy soils, but under congenial conditions it is generally a success. We will suppose that the amateur has procured good seed, and that his ground has been manured and ridged in autumn. During winter it will undergo the changes of weather usual at that season; it will then be fit to receive the seed towards the end of February, or beginning of March, provided it be sufficiently dry, for when the weather seems unlikely to permit of the ground to be trampled over without consolidating the mass into that state, it must not be trod upon at all; but the plot, instead of being sown in continuous rows, may be divided into beds of about 3½ feet each, with 15 in. alleys, and the crop then sown broadcast. This plan, however, need not be adopted when access to the ground can be had without injury; for we prefer sowing in rows about 9 inches apart, as the crop is easier and better managed during the summer, and the produce for a given space of ground is generally larger. Shallow drills drawn by a hoe is best, which cover up when sown; and do not be too particular and exact in the raking, provided the seed be only covered, as that is the principal thing. The smooth nicety with which the ground is sometimes dressed is often detrimental to the crop. The rains which may intervene before the young plants make their appearance, flatten the surface so much, that it presents a very unkind medium for them to vegetate in, while it cannot be stirred until the plants show themselves. On heavy soils it is recommended to apply a mixture of soot and wood ashes, or charcoal, scattering it amongst the soil the Onions are sown in, more especially the top part. This important addition prevents ground from caking into a solid mass, which a stiff soil is prone to do when soddening rains are followed by dry weather. It has other good properties as well, such as checking the ravages of the Onion fly.

To grow a good crop of useful Onions, it is necessary to have a piece of ground that has been liberally manured and deeply

tilled; new, rank manure is not advisable, neither is an excess necessary. If immense bulbs are aimed at, the soil should be rich; and, when growing, manure-water ought to be given liberally; but large Onions are not always profitable, nor do they keep well; the crop that pays best is one of middling-sized bulbs, well ripened in the sun.

For all ordinary purposes, two sowings of Onions are sufficient: one to remain for bulbing, but to be thinned when young, and the thinnings used for salads; and another to follow, to be entirely used while young, and during the heat of summer, when salads are most sought after.

The first essential to a crop of Onions is good seeds; we, therefore, strongly advise the amateur to procure his seed from some reliable source. It is likely that he will have to pay a little more for it on that account, but this will be repaid him in the superior crop he will have, if other things be equally favourable; and we take this opportunity of saying that we are no advocate for "cheap seeds," in the general sense in which that term is understood. Seeds, to be genuine and good, cannot always be grown cheap; and that ruinous competition in the trade, coupled with a sort of gullibility on the part of buyers, has led to various things being offered for sale, at prices lower than those they can be grown for in a legitimate way; and though Onion seed, as a whole, may be more pure than most seeds, yet it is well-known the produce depends, in a great measure, on the seed.

As to thinning. If the soil is thoroughly good, they may be left pretty thick in the rows, and they will all swell to a good useful size; and a dozen bulbs as large as tennis balls are more profitable than a few as big as footballs. Therefore, though a moderate thinning is necessary, and the young ones are very useful for salading purposes, they may be left pretty thick if the culture is all right. Weeding is even more important than thinning. This must be done well and frequently, for as the spears do not spread over the ground to choke the weeds, the latter have it all their own way. As soon as a little green sprinkling of weeds appears, take an old table-fork—for there is nothing better—and lift out every weed; but do not hoe between, or resort to any vigorous measures to break the soil below the surface. This weeding must be repeated as often as necessary, and the ground kept quite clean. A weekly

dose of guano water, or even of weak salt and water, will much improve them, for they like moisture, and must have enough of it. Remember this is one of the most profitable crops grown, and hence deserves every proper attention.

Onions are very definite in their habit. When they have grown as much as they mean to, they twist their own necks and expire quietly. The hot sunshine helps them, and as soon as this happens leave off watering. If there is a little inequality among them as to a disposition to ripen, bend down the necks of the greenest, giving the spears a slight twist, and that will help them into a seasonable sleep. Do not take any up until the top is dry and nearly withered, and then separate the thick-necked or "bull-necked," as they are called, from those that are thoroughly ripe and dry at the crown; the latter are to be stored, and the others to be used as wanted. A second crop, to be drawn young, may be sown in April; and if demands need it, sowing may be repeated from this time to August, when a crop to stand the winter may be got in, on a warm slope, and for these the soil need not be quite so rich.

To grow Onions for pickling, the poorest and driest piece of ground should be chosen. The sort mostly used is the Silver-skin, sown very thick, and after sowing watered once or twice with liquid guano. This will give them a start, and after that they should have neither liquid manure nor any other special nourishment, and they should be but sparingly thinned. If sown in March they will be ripe early in July, and a small bed will furnish an immense number of small neatly-shaped bulbs for pickling. Trim them up, put them in salt and water for a day, and then drain them, and put them in strong vinegar that has been boiled with plenty of spices.

ONIONS FOR EXHIBITION.

It is not generally understood by amateurs that to grow Onions such as are seen at the various autumn shows takes a much longer time than ordinary sized ones, and to be a successful exhibitor the bulbs must be well proportioned, that is, not thick-necked or ill-shaped in any way. To grow bulbs of this class the seed must be sown early and protected till it is safe to put the young plants outdoors. Seed may be sown in February, either on a slight hot-bed or in shallow boxes, but whichever plan is selected, there must always be a gentle warmth to insure germination. Keep near the

light and when the plants are large enough to handle, transplant them into other boxes and place on a slight hotbed till new roots have formed, or they may be planted on the hotbed at once. Should the latter plan be adopted, great care must be taken or the heat may burn the roots. If the young plants have been well looked after, it will be safe to transplant to the open ground by the middle of April. Previous to this, however, they must be hardened off, as oftentimes a sharp frost occurs, which would cripple them unless previously exposed. With some, preparing the ground is no easy task, for where the mould is shallow, with a gravel subsoil, the roots are not able to get down, it is almost impossible to grow large Onions. When ground is of this character add soil to the surface to increase the depth instead of trenching, and tread it firm. But whether the ground be trenched or made deeper by adding, always put some old well-decayed manure at the bottom for the roots to feed on during dry weather, at the same time the plant itself must not be set deeply. One or two good waterings during summer are better than many sprinklings. There is far more art in preparing ground for this crop than is usually imagined, and unless this be thoroughly done, it will be a difficult matter to grow large bulbs. The heaviest bulb we ever saw weighed 4¼ pounds, and was named "Record."

Shallots and Garlic are useful members of the Onion family; the first resembles the Onion in flavour, but does not leave so unpleasant a smell on the palate; the other has a flavour peculiar to itself, and an odour that no one can mistake who has once enjoyed a puff from the breath of a wandering Italian. Garlic gives a peculiar piquancy to soups and stews, but English cooks are not generally acquainted with the proper way to use it, hence it is not a great favourite in our kitchens. In ordinary cookery the Garlic and Parsley should be chopped up together, and popped in at the very last moment, and just allowed to boil up for one minute, then the Parsley preserves its beautiful colour, and the Garlic its delicious flavour—in a well-made hash it is a splendid addition, the Onion is not to be compared with it.

Shallots are propagated by offsets; seed is never saved; they require a rich light soil; the old red Shallot is the best, and keeps well if dry. Plant the offsets from October in light warm soils to February in retentive soils on raised beds, 3½ feet wide; let the rows be 9 inches apart, and the sets 6 inches apart in the row. Like

the Onion, it does not like its bulbs covered when it has once begun to grow; hence, in planting, the set should be just pressed into the earth, and then covered with sifted ashes; the latter to be removed as soon as the bulbs have got a firm root in the ground in spring. No other culture is necessary beyond keeping the ground clean, and occasionally stirring between the rows gently. About July they will be done growing, and must be taken up and dried in the shade, and then stored away. A Shallot cut in half and rubbed over a hot plate before a broiled rump-steak is laid on it, gives it a fine flavour, and in any case where Onions would be used this bulb may very well take its place.

Garlic is grown in much the same way, a single clove is enough for a set, there are several cloves in one bulb, but it is better to delay planting till March, for it is not so hardy as the Shallot. The rows may be 9 inches apart, and the sets 6 inches from each other. The sets may be buried an inch deep, and the best way to do it is to take the clove between the finger and thumb; press them down, and leave the bulb behind, just pressing the earth round it to keep it firm. In June the foliage should be tied in knots to prevent them running to seed, and bulbs may be taken up as wanted, and the entire crop cleared off in August, when the top has withered. If, in storing them, a little piece of stalk is left to each bunch, they may be tied together and hung up in the herb-room, or along the rafters of a kitchen.

Chives are good things to keep in the ground as a resource whenever Onions are scarce, or to use instead of Spring Onions for salads. The green tops as well as the bulbs are used. A couple of yards are enough for all ordinary purposes, and they may be planted as an edging in any odd place, but the soil ought to be good. Plant the bulbs 10 inches apart in spring in little bunches of about 10 bulbs, and by autumn they will meet and form very fresh looking rows. The leaves may be cut over as often as they are wanted, and will speedily be succeeded by others, and if bulbs are required some may be taken up in autumn, and stored for the same purposes as Onions, or they may be left in the ground and will continue to grow for years.

Two of the best exhibition Onions are "Ailsa Craig" and "Record." The strongest flavoured is the Blood-red Onion. The mildest the Spanish and Tripoli varieties.

ON MANURES.

In the vicinity of most of our large towns and cities there are numbers of houses, each having its own particular piece of ground attached, which courtesy, as well as the high-flown language of auctioneers and house agents, describes as a large and productive garden. In a very great majority the occupants spend much of their leisure time, and not unfrequently a great deal of spare cash, in the attempt to obtain some sort of produce, either ornamental or useful. Not unfrequently, however, time and money are both thrown away; the aspect—often of the most unfavourable character—and the nature of the soil baffle their attempts, and even when the first is propitious, the way in which many of the houses are built renders it a difficulty to remedy the second by the application of manure. Some of the houses, indeed, have the means of introducing a wheelbarrow, or it may be a cart, through a gate, down a by-way, but in many instances the only access to the garden is through the house, not unfrequently through one of the sitting-rooms by a glass door. In such cases the introduction of so bulky and unsavoury an article as stable manure is impossible. The more resolute among suburban amateur gardeners who find themselves thus situated, but determined not to give up altogether the cultivation of their fancy plants, make small collections of manure, composed of tree prunings, decayed leaves, lawn mowings, and weeds, in some obscure corner, those among them possessing a little knowledge taking care to have added to the stock occasionally the refuse of the house and kitchen, which otherwise finds its way into the drain or dusthole; this they reserve for the benefit of some few special favourites, or for use on the sunniest border; beyond this the garden receives no manure at all, and its productive powers are soon exhausted. It lies neglected, and to a large extent absolutely useless.

Nothing is more common than for writers on gardening matters to recommend stimulants, without saying how they are made, or how they are applied. Poultry manure makes an excellent food,

if a shovelful, in a partly decomposed state, is put in 30 gallons of water and given to potted plants at every third watering, and outdoor crops once a week. Sheep's manure, at the rate of a peck to 30 gallons of water, and a spadeful of cow's dung to 15 gallons are also very beneficial. A couple of pailsful of horse manure put into a tub, and covered with four pails of water, makes a very useful stimulant for pot plants, diluted before use by four times its bulk. Every time these are used the tub containing the liquid should be stirred up. A good plan is to put the manure in a coarse bag and drop it into water to dissolve. The liquid from a cesspool, if mixed with 20 times its bulk in water, is another useful application, particularly for vegetables. In the winter, when the ground is lying loosely dug up, this material may be put on just as taken out; the winds will modify its burning influences, and the heavy rains will wash it into the ground, and render it harmless to vegetation by spring. It must not be buried, but poured on the surface on open pieces of garden ground, and not near the roots of fruit trees, or they may suffer.

Artificial and chemical manures, such as guano, nitrates, potash, and ammonia, require careful handling; in most cases a teaspoonful added to a pail of water is quite sufficient; when used according to some scientific formula they are most serviceable, and each in its proper place is of the greatest help to crops. On a lawn, for instance, where clover is smothering the grass, if it is desired to get rid of it, this can effectually be done by the application of certain of these chemicals, so that by a proper system of manuring quite a revolution takes place in the well-being or otherwise of plants that may or may not be required in certain places.

THE END.

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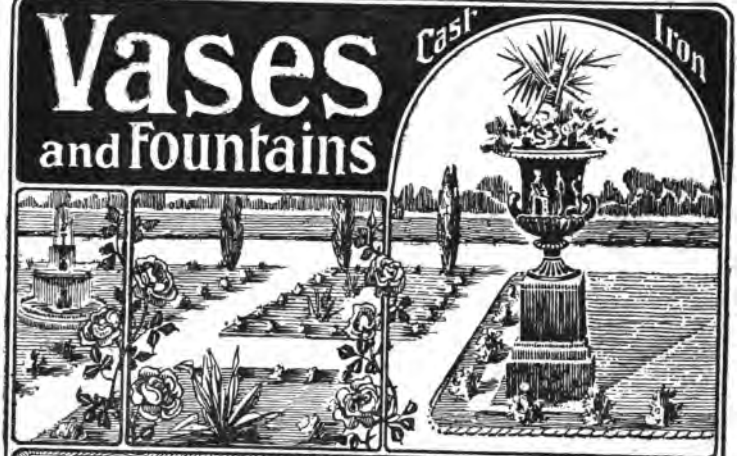

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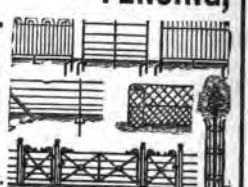

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